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SPECIAL FEATURES

WHENCE THE MODOCK

FLIGHT TESTING AT McCOOK FIELD

THE AUTOGIRO

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The Hardest Flying Problem

MOST aeronautical enthusiasts are, at heart, irrepressible optimists. They are boosters of anything that appears to offer an opportunity of success but are so occupied boosting that they often do not realize or refuse to recognize some of the fundamental problems, which must be solved, if success is to be real and not apparent. By 'apparent success,' is meant operating an airline and by 'real success', is meant making it pay.

There is no more striking example of this tendency than our own Air Mail. Everyone has cheered and boosted the Air Mail, step by step, as it moved toward the solution of the mail transportation problem. Had the general public realized the magnitude of these difficulties it might have lost faith, but airmen, who believe that the problems are solvable, should admit that they exist, face them squarely and strive for their solution.

A through trip over long distances was one of the necessities for real success and this meant night flying. The Air Mail has introduced regular night flying but those who really believe in the Air Mail as a great national service, should have the courage to admit that the problem is not completely solved. The facilities are far behind the needs of the service, as may be shown by a close examination of the number of trips defaulted on the night schedule of the air mail.

Probably the most difficult flying in the world over a regular route is now being done over the night route between New York and Cleveland. Fogs and mountains combine to offer difficult conditions for the regular delivery of air mail. The pilots on this run know more about the utmost which can be expected of a plane than any one else. One of them has made the following suggestions as to what is needed before this part of the transcontinental air mail route can become a real success.

First, a plane is needed which will fly non-stop over the whole mountain district, that is, from New Brunswick to Cleveland, without stop at Bellefonte.

The second requirement is a multi-engined airplane which can fly with any one engine completely stopped.

Third, directional radio, while an altimeter which registers distance from the ground and not atmospheric density, is another necessity.

With these, there is also needed a wing and fuselage, which can be heated so as to prevent the formation of ice, which either adds undue weight or endangers the controls.

These suggestions, coming as they do from one who is actually flying the route, should be studied with care. If the air mail cannot be run, with sufficient regularity, over the Alleghenies at night, to give satisfactory service, and the volume of mail carried shows no increase because of unreliability, some remedy must be sought. The above suggestions are susceptible of practical application and, if they are necessary for real success of the Air Mail, they should be considered in connection with the Air Mail appropriations for 1926.

A Color Scheme for Commercial Aircraft

WITH the ever increasing use of the airplane as a commercial carrier and with special reference to air mail operations, it would seem likely that the question of a color scheme to be adopted by the operators of fleets of aircraft, will become important. Just as at the present time we find bus service operators, taxi service operators and, in some cases, even railroads, adopting a definite color scheme as standard for all their fleet of carriers, so, eventually, it seems probable that airplane operating concerns will do likewise.

The question, therefore, seems worthy of comment since there may be some useful purpose to be served other than the mere standardization of equipment, in the adoption of a definite color scheme.

The advertising value of such a system is now fully recognized and can find precedent in the large majority of commercial air transportation organizations now in every day use, where the particular color scheme adopted renders each individual carrier belonging to the company, a self advertisement by reason of its outstanding color.

The question of a color scheme brings even further suggestions to mind. With the possibility, no matter how remote, of an airplane flying over a recognized route, losing its way due to fog and perhaps, being compelled to land, it seems likely that, should such a plane become lost, the color of its wings and fuselage may play an important part in its being rapidly located from the air by other airplanes. The difficulty here, however, would seem to lie in the fact that the type of ground over which an air route may pass is so changeable that no color would prove universally satisfactory from this standpoint.

The suggestion that all commercial air transport planes should carry a reel of a vividly colored streamer, arranged to be let out from the underside of the fuselage in the event of a forced landing is a most interesting one. In such a case the pilot would permit the reel to unroll immediately prior to the actual landing and thus, in the event of the plane being forced down onto thickly wooded country, for example, the streamer lying over the tops of the trees, would indicate clearly the location of any missing plane. The equipment of every commercial airplane working on a regular air route in this way, would seem to be worthy of careful consideration and its presence should no more intimidate the would-be air traveler than does the presence of a life buoy or life boat on an ocean liner or the emergency brake chain in a railroad car, keep away passengers.

Whence the Modock

African Progenitor Traced to His Original Useless Wenlike Origin

By CY CALDWELL
(Expurgated)

mo-dock, mo-dock, *n.* One who attaches himself to any popular movement for purposes of self-advertisement or social prestige, a *wen* or *bunion,* a total loss. Derived from the Latin, 'Mozo'—nothing; and the Greek 'Docko'—divided by two. *Woofus's Unabridged Dictionary.*

THE definition quoted above is clear enough, so far as it goes, but the earnest seeker after truth and first causes, must seek further if he would find just how the word was coined and how it came to be included as a standard word in our language. It was used originally to tag a tribe of African bushmen discovered by Professor J. Woofus, who, in his interesting book of travels, "Modocks I Have Met," says of them:

"An examination of their skulls by use of stethescope, microscope, and gas-mask—for the tribe were in bad odor politically at the time,—revealed an internal condition of partial vacuum. New ideas given them would enter their skulls with a peculiar plop, rattle about inside for a moment, and then fall right out. I found this tribe utterly incapable of thought and, for over a year, lived with them on a pleasant basis of mutual understanding.

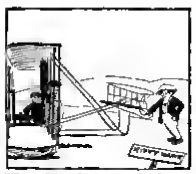
An examination revealed an internal condition of partial vacuum."

"Their social customs were strange. They would gather at a feast, which they would devour with wolfish ferocity, after which one of their number would rise and make a very long speech, which none of the others listened to. This I may add, was the only sign of intelligence I observed in the Modocks. When the speaker had concluded, his listeners would signify their relief by clapping their hands loudly, after which another Modock would rise and not be listened to either. This odd procedure would go on far into the night, Modock after Modock getting up, talking and saying nothing, and sitting down accompanied by loud cheers.

"They subsisted mainly on the flesh of the dodo, a very dull-witted bird, even then nearing extinction, owing to the attacks by the kiwis. This diet they varied by eating a fish called the sucker, which is even more plentiful in Africa than in New York, its native habitat."

Modock Origin Forgotten

We have quoted enough from the Professor's book to discern how the name of Modock was applied fittingly to various excrescences or morbid growths, that have attached themselves to aviation. In thoughts and habits they so nearly resembled the African Modock that the name has been given them without question, and even the dictionary describes only the present American Modock and forgets entirely his African prototype. This is surely a compliment to the African.



"But there he was, slowing up aviation."

The Modocks have always been prominent in America; they are professional joiners and will join anything that promises the possibility of getting their names and their pictures in the papers. These are the people standing right next to the Governor when he lays the corner-stone of the new asylum; these are the people whose names appear in the papers under the words, "At the speaker's table were——." But it was not until 1903 that the Modocks threw their energies solidly into one line of work. They discovered aviation.

Before making their first flight at Kitty Hawk, N. C. the Wright brothers spent some time working on their little motor. Pausing one day in their labors they straightened up and looked around them. They saw, leaning on the frail elevator that cracked beneath his weight, a small, insignificant man with an earnest, though slightly vacant expression on his face. He was a Modock. How he got there, nobody knew. But there he was, slowing up aviation. And he's been at it ever since.

"All the well known broken arches in the country joined immediately"

He witnessed that first historic flight, got in the papers as a witness, and was on hand and in the way again at Fort Myer, Va. in 1908 when the Wrights demonstrated their plane and sold it to the Government. The Modock again got in the papers as "Prominent Clubman witnesses signing of Contract." This tickled him to death and he rushed back to Washington, his earnest face almost expressive of an idea, and told his fellow-Modocks of the amazing invention that would get them all in the papers, if only they would attach themselves, leechlike, to it.

Form Club to Talk

At once they formed the Modock Club of America, and all the well-known broken arches in the country immediately joined. Old women of both sexes, became charter members and had a whale of a good time at the conventions making speeches that nobody except reporters ever listened to. But so long as they listened,—and got bits of it, much garbled, in the papers—the whole purpose of the speaker had been attained. That was all he was after, anyhow.

The avowed purpose of the Club was to further the interests of aviation, which was written into the Charter with sly winks and nods. While that was going on, the members were busy handing their pictures and typed copies of their speeches to the reporters. A lot of personal publicity got into print so that people at large soaked up the idea that the Club was responsible for whatever progress aviation made.

"Armed guards were put on all the factories so that no airplane could escape"

It really did progress, for the Wrights and Glenn Curtiss and Glenn L. Martin and others of the boys, were building planes, and, simple fellows, even flying them. However, for every flight these poor chaps made in a plane, the Modocks made at least two vocal flights at banquets so this competition was not serious.

With the entry of the United States into the war, American aviation took a leap ahead and lugged the Modocks with it. They branched out tremendously. The papers were full of them. They descended on Washington as $1.00 a year men, which was about the most expensive dollar the country ever spent. They all got themselves little American flags which they waved heartily and bravely when the boys marched down Pennsylvania Avenue toward the war. Some of them wore out as many as three flags during the war, so you can see how they must have suffered.

During the war, the Modocks dashed about, eating dinner after dinner, making speech after speech. Production was speeded up to such a terrific pace that all the machinery rattled and fell apart every week or two and had to be glued together again before any more planes could be turned out. Armed guards were put on all the factories so no airplane could escape and get to the war before it was over.

The deplorable part of the whole affair was that, in spite of all the Modocks could do, the Army and Navy actually did get Air Services together and with the help of France and England got their pilots up in the air on foreign built airplanes.

"The Modocks leaped on him with hoarse growls."

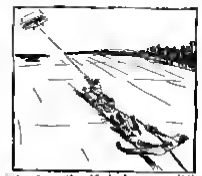
These boys were young and enthusiastic and took the war seriously and in many cases shot down the enemy. Such had never been intended, and was a blow to the Modocks. Instead of the usual news of dinners and speeches and resolutions, there began to creep into the papers items about American pilots shooting down enemy aircraft. The whole thing became inexpressibly crude and distressing, and 16 resolutions were passed at a banquet condemning the business. Fortunately, however, we were able to stop the war before any of our airplanes escaped from the factories to add to the carnage overseas.

When it was learned that one little Modock was getting all the publicity the other Modocks crept quietly away saddened but no wiser. Such blows dealt the Modock Club of America undermined its constitution, so no one was surprised when it vanished out.

It rose, however, Phoenix like from the dead ashes of the past, and came to life,—or as near an imitation of life as could be expected,—as The National Modock Association.

To give a semblance of aerial activity to the association, a few regular fellows were dragged in as State Governors and members. But these were too few in numbers to make much difference. They struggled along, growling and kicking, but nobody paid any attention to them. They were out-Modocked by the majority. All they could do was attend the conventions and listen to speeches by Fuddydudds.

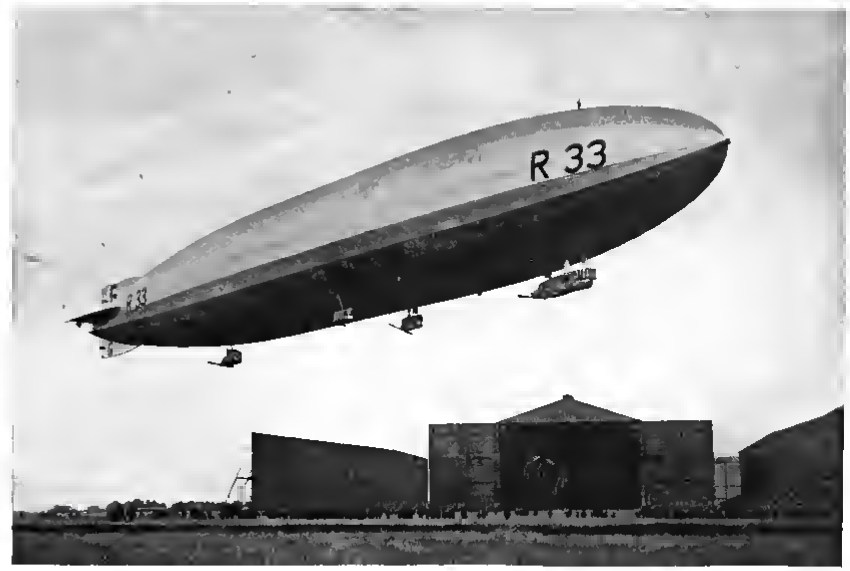
It was not to be expected that any progress in aviation would be encouraged by a race whose African prototypes had never been able to catch up with anything smarter than a dodo kiwi or a sucker. So, when a bird, who knew only how to fly and fight, got up and pointed out a few things that were all wet, the Modocks leaped on him with hoarse growls and proceeded to bite him where it would do the most good. He was promoted from Brigadier to Colonel, and the elevator is still going to the basement.



"Anyhow the Modocks are solidly behind aviation"

At this date, the flying personnel of the Army and Navy, their technical staffs, the Air Mail, the manufacturers, and the commercial operators are struggling on, trying to make the airplane get somewhere, anywhere, except where it is,—nowhere. It's an unwanted child, slightly malformed, somewhat undernourished. Test pilots are struggling with it, and telling engineers what's the matter with it. The engineers are practising plastic surgery on it, hoping it will gain strength. Commercial operators are giving it a chance to earn its keep and grow to maturity.

Anyhow the Modocks are solidly behind aviation,—how far behind, I can't say. They have conventions and dinners and speeches, and make resolutions and motions—motions surprisingly like those of a windmill that goes around and round and round and travels forward not an inch.



The British Airship R33

Flight Testing at McCook Field

Methods Adopted in Full Scale Testing of New Airplane Designs.

By LIEUT. E. H. BARKSDALE

FOR CONVENIENCE, the subject of flight testing as conducted by the Army Air Service at McCook Field will be considered under two headings: First, flight testing new airplanes delivered by manufacturers, to determine if the airplane can meet the performance specified in the contract, and second by, testing the airplanes to secure some specific comparative performance data, such as the performance of an airplane with different propellers and with different engines, and, in addition, certain research problems concerning stability, required safety factors, etc

Flight Testing of New Airplanes

This flight testing is conducted by the test pilots assigned to the Flying Section of the Army Air Service Engineering Division It requires the utmost attention to detail as the following manner of procedure will indicate.

Lt E. H. Barksdale ready to take off on a test flight. Note the stop watch and the data card

As soon as a new airplane is received and assembled, it is flight tested to determine the performance of the airplane and engine under normal conditions Next, it is timed over a level speed course of known distance. The various tests conducted to determine this performance data are known as High Speed Test, Calibration of Air Speed Indicator, Sawtooth Climb, Check Climb, and Cooling Test.

High Speed Test

In order to conduct this test satisfactorily, a stop watch is suspended around the neck of the pilot from a cord, a strut thermometer is attached to the strut, and a data card with a pencil attached is fastened to a board and strapped to the Pilot's right leg. If the air is extremely "bumpy", or if it is deemed desirable to check the ability of the pilot to hold the airplane level on the course, an air speed recorder is installed in the fuselage Careful study of the completed data card will show whether or not the various courses have been flown accurately and consistently

Immediately before taking off, the pilot obtains the r.p.m. of the engine on the block, and the strut temperature at the ground.

While running the high speed test, the pilot should reach the lowest part of his level flight, which is approximately 10 to 20 ft. above the course, with full throttle, at least a mile before he crosses the first marker on the course, so that the airplane and engine have stabilized themselves to their normal high speed. The course is, of course, always flown with the markers on the left. As the airplane approaches the first marker, the pilot takes his left hand from the throttle, grasps the stop watch and, with his thumb, compresses the stem almost to the actual clicking point. As the leading edge of the left wing reaches the near point of the marker, the final click of the stop watch starts the hands around. The pilot must be absolutely certain that the throttle and the spark are stationary while he flies a straight and level course, keeping the long straight black line marking the center of the course on his left, and at the same time mentally noting the r.p.m., the indicated air speed, and the strut temperature.

On approaching the second marker, which indicates the end of the course, he must grasp the stop watch and press the stem in exactly the same manner and at the same place with reference to the location of the leading edge of the left wing and the near point of the marker. The airplane is then pulled up into a gentle climb, the engine is throttled, and all observations together with the stop watch records are recorded on the data card. The return trip is then flown in the opposite direction in exactly the same manner, thus completing one round trip flight. Three successive round trips are required to complete a timed high speed run The average speed obtained is the average timed high speed of the airplane.

Calibration of Air Speed Indicator

The calibration of the air speed indicator is conducted in order to enable the Engineering Division to use the indicated air speeds in computing the best climbing speeds and speeds in level flight at various altitudes It probably requires more care and expert piloting than any other type of flight test For this reason, the test is usually conducted on a calm day, either early in the morning or late in the afternoon. There are times when the day is apparently perfect for ordinary flying but the "humpiness" of the air near the ground makes it almost impossible to obtain a satisfactory calibration

The equipment required to conduct this test includes, in addition to that required for running the high speed test, an air speed recorder, as a definite check against the indicated speed and of the pilot's accuracy in maintaining a constant speed over the course. The course used is the same as that used for high speeds. The airplane should not be flown at any definite speed for over a half minute before beginning the calibration, inasmuch as it may cause confusion when extracting data from the air speed recorder chart.

The first run of a calibration is to obtain one round trip at high speed, with full throttle, exactly as outlined above, except that is absolutely necessary that, immediately on completion of a run each way, the airplane be pulled up sharply in order to make a definite and abrupt indication on the air speed recorder chart. This slower speed must be maintained until the pilot is ready to start on the return run, when the indicated speed will be increased again to the approximate level flight speed

The second and all other round trips will be made identical with the first, except that each time, the throttle must be adjusted so that the airplane will enter and complete the course at just ten miles slower indicated speed than was shown on the preceding run The adjustment of the throttle for certain speeds is a very delicate performance, and the pilot will need all the distance he can get prior to reaching the first marker on the course, when he will momentarily have to take his hand from the throttle in order to use the stop watch. These successive round trips are completed, each one being ten miles slower than the last, until it appears that the plane is at its very lowest flying speed and its minimum r.p.m After this last mentioned flight, another round trip is made at an indicated air speed of from five to ten miles less than the previous one, but which requires as many or even more r.p.m.'s than the previous flight with higher speed. This completes the calibration and is termed "getting over the hump" as is shown on a plotted curve when the data is worked up.

Although the airplane must be pulled up sharply at the end of each speed run, this procedure is reversed during the latter half of the calibration, when the speeds are becoming low, hence, the throttle will be opened and the plane caused to gain more than the speed just flown over the course, in order to put a break in the record of the air speed recorder.

Sawtooth Climb

The purpose of the sawtooth test climb is to determine the speed at which the airplane climbs fastest at various altitudes, in order that the plane can later be climbed to its ceiling in the shortest possible time This test differs from those outlined previously, in that it is necessary to climb a definite distance at several given speeds, varying from ten to fifteen miles above its approximate best climbing speed, in ten-mile changes, down to ten to fifteen miles below its best climbing speed In addition, it is necessary to make a level flight at the midway point between the highest and lowest parts of each sawtooth The instruments and accessories required in the performance of this test are the data card, strut thermometer, air speed recoeder, and recording barograph

The Thermometer attached to the strut

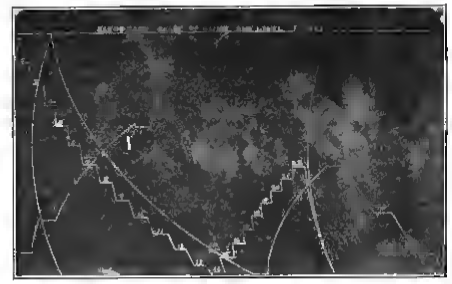
The method of procedure is as follows. Immediately before the engine is started the altimeter is set according to the barometric pressure translated in hundreds of feet. The barometric pressure is obtained each morning and afternoon at McCook Field and entered on a chart kept for that purpose The barometric pressure usually ranges from 200 to 800 ft. above sea level The strut temperature on the ground is then noted, also the full throttle r.p.m. on the blocks The pilot takes off and hap-hazardly climbs to a predetermined altitude, where he begins the first of a series of "sawtooth" climbs.

The data card has been carefully prepared by an experienced and specialized engineer It outlines the various altitudes at which the airplane will be flown, and also the speeds at which they are to be flown For instance, if the service ceiling of the airplane should be approximately 21,000 ft, and the best speed obtained for climb at the ground was approximately 95 m.p.h., the data card would call for one sawtooth probably between 2000 and 4000 ft above sea level, another between 10,000 and 11,000 ft. and the third and last one between 19,000 and 20,000 ft The speed at the lowest saw-tooth would range from about 115 m.p.h. maximum, at ten mile intervals, down to 75 m.p.h minimum. The speed at the second sawtooth would range from about 110 maximum to a minimum of about 60 At the highest sawtooth, the climbing speed would range from about 100 down to 60, and if the plane were climbing satisfactorily at the lowest speed, an additional climb would be made at a still lower speed If, at any time, the climb at the speeds given, becomes exceedingly slow, it is only necessary to hold that speed for a three-minute period and record the results.

Immediately after completion of the series of three sawtooth climbs, the airplane is landed, and an experienced flight test observer determines from the results shown on the data card, the air speed recorder, and the barograph, the indicated air speeds at which the airplane climbs best at the various altitudes. The observer then prepares another data card for a check climb, giving the indicated air speeds at which the pilot will fly from each thousand feet, to the next thousand, continuing on up to its ceiling.

Check Climb

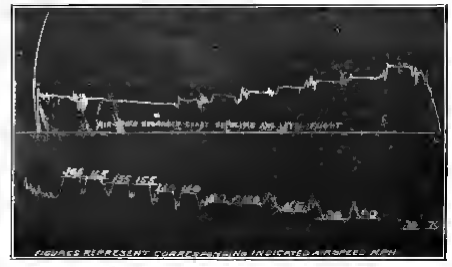
The purpose of this climb is to determine the speeds in level flight at all altitudes, the rate of climb, and the time required to climb from sea level to the service ceiling of the airplane.



Double transverse barograph chart outlined on smoked paper, showing steady climb to 14,000 feet Level flight, then climb to 22,000 feet, descent, and level flight at 18,000 feet level flight at 15,500 feet, level flight at 12,000 feet, level flight at 10,000 feet and level flight at 5,000 feet The calibration marks on this chart are shown in the numbered steps

The equipment required to conduct this test, includes a recording barograph, air speed recorder, strut thermometer, and a data card. This data card is prepared from the results obtained in the sawtooth climb, and gives the indicated air speeds to be held during the climb

After the altimeter is set to correspond to the barometric pressure, the airplane takes off, holding as closely as possible the proper indicated air speed shown on the data card, and continuing to climb until the plane appears to be at or very near its actual ceiling During this climb, the pilot attempts to obtain the maximum r.p.m. of the engine by controlling the temperature and air compression Beginning at the 2000 ft. level, the engine r.p.m. and strut temperature are recorded at each successive 1000 ft. toward the ceiling. By comparing



Typical air speed recorder charts, of climb and level flight.

the altimeter with the clock, it is an easy matter to determine when the airplane has reached its ceiling, as, when the rate of climb becomes less than 100 ft. per minute the service ceiling has been reached and the absolute ceiling is being approached. The theoretical absolute ceiling is practically never actually reached.

Upon reaching the maximum altitude obtainable, the engine r.p.m., air speed and strut temperature are recorded, and a level flight high speed run made at this actual ceiling altitude. If it were possible to reach the absolute ceiling, the data obtained in the high speed run would be identical with the last data recorded as the best flying speed, etc., at the ceiling. On completion of the level flight at ceiling, a series of approximately five or six level flights are made at various altitudes, equally divided by the number to be made between the ceiling attained and the ground, during each of which the indicated air speed, engine r.p.m., and strut temperature are recorded.

In estimating the best climbing speed of an airplane when no data is available, the rough rule is to use sixty per cent of the indicated level high speed at ground for the initial climbing speed, and deduct one mile per hour for each 1000 ft of altitude up to the ceiling.

Cooling Test

The cooling test is conducted to ascertain if the radiators installed in the airplane are capable of cooling the engine to a sufficiently low temperature to insure its most satisfactory performance. An airplane having materially more cooling surface than is required, is very rarely delivered to the Engineering Division for tests. Hence, when trouble is experienced with the cooling system, it is invariably due to insufficient cooling area.

The same instruments and the same preparations are necessary for this test as for the check climb test. In addition, it is necessary to have the radiator full of pure water, and a thermometer (in addition to the one registering the water temperature out of the engine into the radiator, which all pilots use in every-day flying) installed to register the temperature of the water passing from the radiator to re-enter the engine. In order to facilitate identification, the additional thermometer installed for this test is always marked "IN"—with white letters, and the regularly equipped thermometer marked "OUT". The degrees of cooling are figured from the readings of the two engine temperatures, in conjunction with the reading of the strut thermometer, which gives the outer air temperature.

Data Continually Recorded

The take-off and climb to the prescribed altitude, which usually ranges from 8,000 to 12,000 ft., are made at the same speeds as the check climb, but the radiator shutters must be open throughout. At each 1000 ft. above the ground, the engine r.p.m., the strut temperature, and the water temperature into and out of the engine, must be recorded. The difference in the two readings usually ranges from five to ten degrees. If, at any time during the climb, the water temperature out of engine falls below 45° C., or boils, or the engine begins to malfunction, the exact data is recorded and the climb discontinued.

As soon as the climb to the prescribed altitude is completed, the shutters are closed, and the airplane descends to about 3000 ft. or below, where a level flight, at full throttle, with shutters wide open, is made. This level flight must be held as stable as is humanly possible and the air speed, r.p.m., strut temperature, and water in and out temperature recorded every two minutes, until all temperature readings remain constant for three consecutive readings. When three consecutive readings have been obtained, the cooling test is completed.

As soon as the pilot lands, the radiator is filled with water, the water necessary to refill it being measured, in order to determine the amount of water lost in flight. This data is also recorded on the data card. Any other peculiarities of the particular airplane that might have some effect on the cooling of the engine, are also noted on this card. For instance, if the carburetor is running too rich or too lean, it sometimes has a noticeable effect on the cooling of the engine. The data card must also be completed to show whether or not the full military load is present, if the cowling is in place, and if a scoop is used.

(To be concluded)

The Curtiss F6C2. The newest Navy single seater pursuit plane. The plane is practically identical with the Army PW8B and is designed for use either as a seaplane, as in the photograph, or as a land plane, in which it is equipped to land upon and take off from the deck of an aircraft carrier. As a seaplane, the machine is capable of 155 m.p.h. maximum speed and has a ceiling over 16,000 feet. It is equipped for catapult launching at sea.

De La Cierva Autogiro Achieves More Success

Airplane Involving New Principles in Design Satisfactorily Tested

As recently reported in these columns, successful trials were, on Oct. 12, carried out on the la Cierva Autogiro, at the Royal Aircraft Establishment, Farnborough, England. The Autogiro was invented by Senor Juan de la Cierva and since 1923 has been flown repeatedly and tested in both France and Spain as well as in England.

Since its first conception, the design has undergone a few minor changes which have tended to improve the performance of the machine.

The machine has a fuselage with engine and propeller like an ordinary airplane, but instead of being supported by wings there is a four-bladed wind vane mounted on a mast in front of the pilot. The wind vane is not driven by the engine, instead it rotates freely under the impulsion of the air stream generated by the propeller and thus it supports the machine in the air.

Capt. Juan de la Cierva, inventor of the Autogiro

The Autogiro is not a helicopter. In fact, the machine is based on principles entirely different from those followed in the construction of helicopters as well as of airplanes. A helicopter is sustained in flight by a lifting propeller, which an engine causes to rotate in a horizontal plane and it "lifts off" vertically. In the Autogiro, on the contrary, the big four-bladed propeller which is mounted on a vertical shaft fixed on the fuselage, is not actuated by any power plant, but, instead it, is made to turn freely on its bearings. Consequently, this "screw" is actually a wind vane, which operates like the little propellers used to actuate the fuel pumps of aircraft engines, that is, it is the relative wind created by the forward motion of the airplane which causes it to rotate.

On the Autogiro, the big wind vane is mounted in ball bearings and is not controlled in any manner by the pilot. The blades of the vane are set at a fixed angle of incidence relative to the axis of rotation, but they are hinged to the bearing shaft in such a way that in flight they place themselves according to the resultant of their lift and centrifugal force.

Loadings Equalized

The mechanism, which is used to equalize the loadings between vanes, is nothing but a free hinge at the inner end of the spar of each vane. The hinge would permit the vanes to fold downwards, were they not supported from above by wires and rubber shock absorbers. The vanes are perfectly free to fold upwards. The angle of incidence of the blades is fixed, but incidence adjustment is secured automatically in virtue of the hinging of the vanes. If a pair of vanes are considered at the moment when their spans are fore and aft, their air speed is that due to rotation only. As the after

The la Cierva Autogiro, which has recently been tested in England. In the photograph the short struts attached to the lower longerons of the fuselage may be seen, upon close inspection. These struts are fitted with ailerons for lateral control in flight. The characteristic Avro 504K type fuselage and undercarriage will be recognized.

of these vanes moves around and forward, its air speed is increased by the forward speed of the machine, and this tends to increase the lift on that vane. The result is that this vane folds upwards which movement effectively decreases the incidence. The forward vane, as it moves round has its air speed decreased, and, accordingly, falls, increasing the incidence.

The Autogiro in Flight

Principles of the Autogiro

It is known from experiments that when a stationary propeller is exposed to an air current, the blades, being in position A (Fig. 1), have a resultant, R, which makes an angle

with the propeller shaft. The resultant P of the opposite blade (position B) has always a smaller angle than A or is negative. Therefore, a rotation is established by the propeller in the sense of the arrow. The speed of rotation will increase until the resultant of R and P is parallel to the axis of rotation of the propeller. The whole lifting body does not transmit to its shaft any torque except the one produced by the friction of the bearings, which can be neglected, eliminating, therefore, the necessity of using two propellers.

A Matter of Relative Speeds

However, the resultant velocity of the blades relative to the air in position A is greater than in B and its lift will be greater also. Therefore, the total resultant of this propeller will not pass through its center and the whole system will

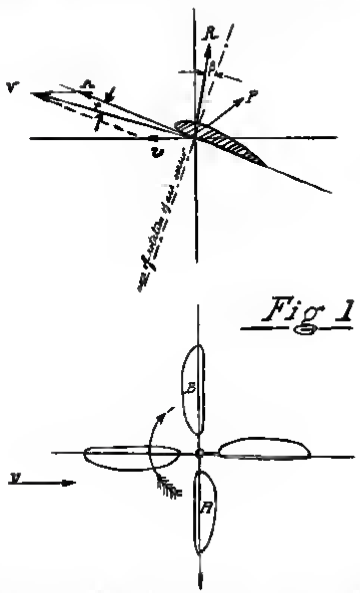


Fig 1

tend to bank. This banking effect has been overcome in the Autogiro by fixing the blades to the shaft by means of a hinge, which permits them to set themselves automatically in the resultant position of the centrifugal force and the lift.

In this way, blade A will bank slightly, while blade B will remain horizontal and the total resultant of the lifting propeller will always pass through its center.

The velocity of the blades relative to the air is much greater than the translational speed of the whole machine. The angle of attack is a function of the translational speed of the machine and the angle between its direction of motion and the plane of rotation of the blades. This allows a much greater range of speeds and angles of flying to the whole machine, and will permit landings in very small spaces without horizontal motion.

Brief Performance Details

The Autogiro weighs about 880 lb empty and 1100 lb loaded. The horizontal speed attained is from 38 to 55 m.p.h. The rotational speed of the lifting vane is about 140 r.p.m. in horizontal flight. The descending speed in vertical landings is of about 6-10 ft. per second.

The Inventor

Senor Don Juan de la Cierva is 29 years old, and comes from one of the oldest and best families of Madrid. He is the son of one of the most popular Spanish political figures who has been several times Minister of the Interior, Minister of War and Minister of Finances, being at present the chief of a Spanish political group. He is a graduated engineer and has built successfully several airplanes since 1912. He started to work on his first Autogiro in 1920.

S. A. Cisler New Air Mail Supt.

In October, Mr. S. A. Cisler was appointed General Superintendent of the Air Mail Service succeeding Carl F. Egge, who has been transferred to the Western Division.

S. A. Cisler, General Superintendent Air Mail Service

Mr. Cisler is well and favorably known throughout the Post Office Department.

He was born at Caldwell, Ohio, April 5, 1889, is married and has two children, both boys in their early teens. Mr. Cisler's first employment in the Government service was as a clerk in the Denver Post Office in April, 1888. He was appointed a railway postal clerk from Denver in December, 1891, and served in that capacity until October, 1901, when he entered the sea post service. After serving in this position approximately fifteen months he returned to the Railway Mail Service in Colorado. In August, 1904, he was appointed a rural agent for the Post Office Department, in November, 1905, he was appointed a post office inspector, serving in that position until February, 1913, when he was promoted to the position of Division Superintendent, Railway Mail Service, at St. Paul, Minn., which position he has occupied continuously to the date of his appointment as General Superintendent of the Air Mail Service, with the exception of a period of about ten months. During the time he was employed as Division Superintendent, Railway Mail Service, he served in the St. Paul, Minn., Washington, D.C., St. Louis, Mo., and Omaha, Nebr., Divisions.

In the early part of 1918 he was selected by the Postmaster General for the position of U.S. Postal Agent in France to handle mails for the Expeditionary Forces, which he declined. Later in the same year he was again offered the position of U.S. Postal Agent in Siberia to handle the postal business for the American Expeditionary Forces in that country. He served there until the major portion of the troops had been withdrawn from that country.

Mr. Cisler's ability as an administrative officer ranks with the very best in the Postal Service. While Mr. Cisler has no technical knowledge concerning aviation, he is a keen student and has closely followed the progress of aviation for a number of years. He is extremely enthusiastic as to the development of commercial aviation.

The New Handley Page Air Liner

A New Three-Engined Airplane for European Air Lines. Reliability Greatly Increased by Triple-Engine Principle.

In a recent editorial, AVIATION commented upon the significance of the fact that Germany, despite her restrictions, had put into regular operation, on the air routes, a three-engined passenger air liner capable of flying on any two engines. Reference was made to the new Junkers three-engined airplane. The point was made that Germany was the first among European countries to put into regular operation an airplane with this capability, for it was thought that other three-engined machines, which had been developed, had not demonstrated this characteristic, which is of such importance to reliable air transport. We are glad to be in a position to enlarge upon this subject and to correct any misconception.

In commenting upon this statement, an interesting letter has been received from Mr. Handley Page, in which he draws attention to the extensive use of three-engined Handley Page airplanes by the S.A.B.E.N.A., on regular European and African air routes. Mr. Handley Page, discussing these activities, says that the type "has been in operation throughout the whole of this year on the services run by the S.A.B.E.N.A. (Société Anonyme Belge pour Exploitation de la Navigation Aerienne) between Amsterdam-Rotterdam-Brussels-Basle, and with even greater success on the service which the same company, in its African division, are running along the Congo. The first of these three-engined machines was flying early last year, and it was on a similar machine, but built in Belgium, that Lieutenant Thieffry, Lieutenant Rodger and Mechanic De Brucker flew from Brusselles, through France, Spain, across the Sahara and equatorial Africa to the Congo, in February last.

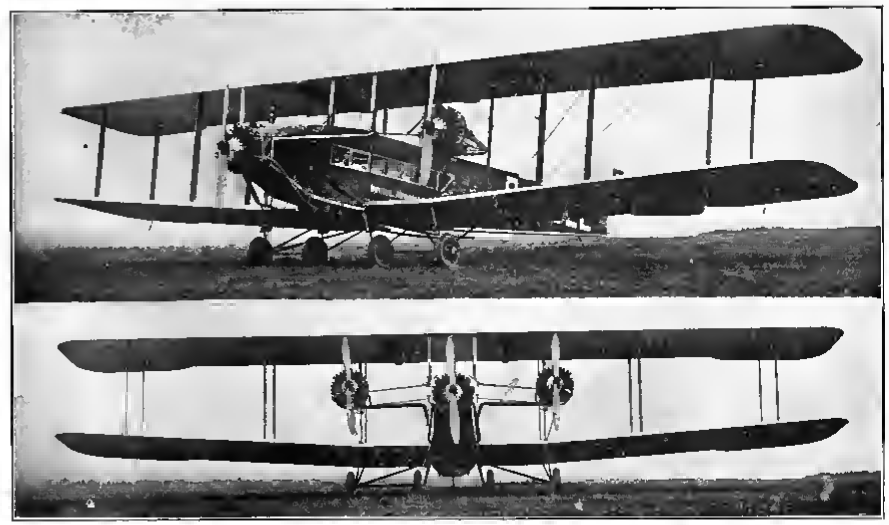
"With the full load on the machine, it will fly either on the two Siddeley "Puma" engines, or on the Rolls and one Siddeley "Puma".

"Shortly, a newer type still, will be coming out, comprising a machine of similar design and slightly larger span, fitted with three Siddeley "Jaguar" air cooled engines, and carrying 14 passengers and 700 lb. of luggage.

"I notice what you say in your editorial in regard to the horse power per passenger, but a comparison on these lines is not always a true one. For instance, in the DH54 there is accommodation for 14 passengers, but in the three-engined Junkers machine, which I have seen at Croydon, there is only accommodation for 9 passengers, and, though a greater load might be carried if accommodation were available, there is no means of getting it on the machine. My point here, is that if one were carrying load in the machine instead of passengers, the weight could be accommodated in a much smaller space, the fuselage could be much smaller and, therefore, the machine would have a lower head resistance. You will always find on investigation, that greater comfort for the passengers is obtained only at the expense of performance, either the greater weight and cabin furnishings, diminishing the useful load, or the larger size of the aircraft cabin increasing resistance and diminishing top speed."

The three-engined machine discussed by Mr. Handley Page is the earlier type powered with two Siddeley engines and one Rolls-Royce engine. The more recent type, to which brief reference is made, is the Handley Page, W9, with three Siddeley "Jaguar" radial air cooled engines, a complete description of which, together with photographs, is given herewith.—Ed.

THE Handley Page type W9, known as the "Hampstead," is a development of the twin-engined Handley Page machines, which have been flying since civil aviation commenced in Europe after the War, on the London-Paris air route. Some of the Handley Page W8 type machines have now flown more than 3,000 hr., or approximately 300,000 mi., and have carried many thousands of passengers. This latest air liner, which is to be used by Imperial Airways, has three air-cooled Armstrong-Siddeley "Jaguar" air-cooled radial engines in place of the twin water-cooled engine installation of the previous types.



Two views of the Handley Page "Hampstead," which is equipped with three Siddeley "Jaguar" air cooled engines.

From the point of view of regularity, reliability and safety, a multi engined machine offers great advantages at the present time over the single-engined type. Experience has shown that the possibility of two engines giving out at the same time is exceedingly remote and, therefore, forced landings outside a flying field are practically done away with in the multi-engined type of airplane.

Can Fly on Two Engines

The new three-engined Handley Page airplane described herewith is, it is claimed, easily able to fly on any two engines, should one break down, and to fly for quite a long distance on one engine only. The Armstrong Siddeley air cooled engines with which it is equipped avoid, as in the highly successful Wright "Whirlwind" type, all the trouble of water leakage, etc., which is inherent with radiators and water pumps, so that one cause of possible breakdown is eliminated.

The engines are situated, two between the wings, one on either side of the central fuselage, and one in the nose. They each develop, approximately, 400 hp at 1700 r.p.m. and are supplied with gasoline from tanks fitted to the upper wings of the aircraft. These tanks are well away from the fuselage, so that there is no question of fumes or vapour making the cabin uncomfortable for passengers.

The pilot and mechanic are accommodated in the cockpit in the nose of the fuselage, behind the front engine, a special ladder at the side of the fuselage giving access to this cockpit. Behind the pilot's seat, a trap door also gives communication with the passengers' cabin. This latter is a long compartment, 17 ft 5 in long, and 4 ft 5 in wide and 5 ft 10 in. high, with toilet accommodation at the rear. Fourteen seats are provided for the passengers, and a luggage rack is fitted the whole length of the cabin on either side. Special attention has been paid to ventilation. The cabin is heated by hot air obtained from the exhaust manifolds of the front engine, heat being turned off or on, at will, by a control lever in the passengers' cabin. One half of the windows in the cabin can be opened with a very neat sliding window device which allows the glass to be moved up and down, all the windows being of Triplex glass.

Quite apart from the ventilation obtained through the opening of the windows, the air in the cabin is very largely ventilated by air scoops fitted on the outside of the fuselage, which communicate with the hollow tube forming part of the luggage rack. From this hollow tube, air vents give direct passage for the air outside, into the cabin, and, flowing through the cabin the air is exhausted at the back through suitable exhaust outlets. Behind the passengers' cabin is a freight compartment in which no less that 700 lb of freight can be carried.

Performance Trials

The first Handley Page "HAMPSTEAD" has carried out its official trials, and the figures of performance with full power are given herewith. During the trials, it was found that any of the engines could be switched off, and started again in flight by slightly diving the machine. All three engines were stopped in succession and re-started in the air, the airplane also being flown with only two engines.

With two engines only running, and a third engine stopped, the airplane has a rate of climb at 2000 ft. (610 m.) of 200 ft./min. (61 m./min.).

With one engine only running, the airplane descends at a rate of 200 ft./min. (61 m./min.), and a gliding angle of approximately 1 in 20.

These trials were conducted with the full load on board the plane. They would seem to prove its ability to fly to its destination with full load on board, with one engine stopped. The machine has been designed to provide this margin of safety rather than to give a high paying load per horse power for the three engines installed.

Specifications

Dimensions.

Span	78 ft 0 in
Chord of wings	10 ft 0 in
Length, overall	60 ft 4 in
Height	16 ft 8 in

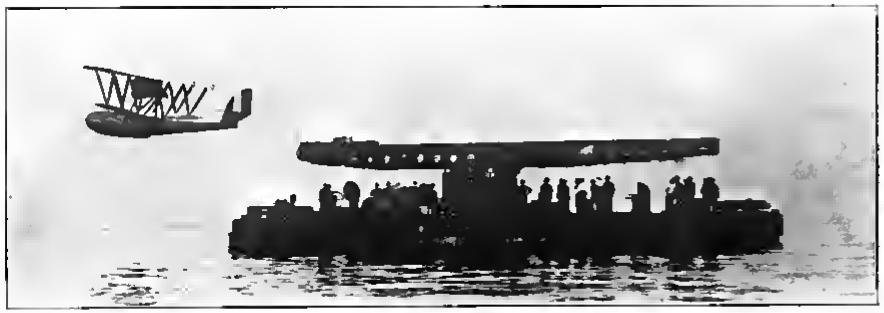
Weights.

Airplane light	8384 lb
Equipment:	
Instruments	
Wireless	
Electric Lighting	
and Cabin Equipment	470 lb.
Crew	
one pilot,	
and one navigator	380 lb
Fuel	
Gasoline 220 gal (4.5 hr.)	1672 lb.
Oil 24 gal	240 lb
Pay load	
Passengers, 14 at 160 lb. each	2240 lb.
Luggage and Freight	3150 lb.
Total pay load	5390 lb
Total useful load	
(Equipment, Crew, Fuel, Pay load)	6136 lb
Total weight of plane full	
(weight light, Useful load)	14500 lb

Performance.

Maximum speed at 1000 ft	116 m.p.h.
Landing Speed	44 m.p.h.
Rate of climb at ground level	1PM 11 /min
Service ceiling	12500 ft.
Get off run	280 yd.
Landing run	200 yd.

ITALIAN CATAPULT LAUNCHING EXPERIMENTS



P. & A. Photos

Catapult launching of airplanes is being experimented upon in Italy. An Italian flying boat is seen just leaving the experimental catapult.

A Suggested Race For Small Airships

By F. R. MAXWELL, Jr.

AIRCRAFT races such as the Pulitzer Race for airplanes, the Schneider Cup Race for seaplanes, and the James Gordon Bennett Race for balloons, have demonstrated the tremendous value of such contests for developing equipment, training personnel, and arousing public interest in aviation. Each year brings forth new records, better performances and greater enthusiasm on the part of the public.

In the lighter-than-air field, the James Gordon Bennett Race has been a fixture for many years and is a splendid international event. It is evident, however, that it is highly desirable to supplement this contest with something which will have more direct bearing on the development of airships. Therefore, a cross country race for small airships is suggested.

A More Spectacular Race

A race for airships would have all the advantages of the present airplane races and, in addition, would possess certain special advantages of its own, due to the type of craft involved. Such a race could be laid out across country and the course arranged to include the most thickly populated sections, without in any way endangering either the participants or the spectators. Hence more people could see it than could possibly witness any other type of contest. The race could be started with a flying start, like a horse race or boat race, without undue danger to the participants. This fact, together with the large size of the ships, which would make the start a wonderful spectacle which would attract great crowds.

Finally, as a sporting event, an airship race would surpass races of any other mechanically driven vehicle, as the human element would have a great deal to do with the final result. It would require, on the part of the pilot, unusual knowledge of meterology and navigation and great skill in the actual handling of the ships, to take full advantage of the air currents and to get the greatest possible speed out of the ships. On account of the fact that the speed of airships increases with an increase in dimensions, it would be necessary to restrict the size in order to keep the expenses of building and racing them, as low as possible.

It would be practical to so restrict the entries that they would be comparatively inexpensive. Restrictions of some kind have been found necessary in nearly all types of sporting contests, in order to keep the expense within reasonable bounds. In fact, restricted class racing has done much to develop the sport in yachting, motor-boating, horse racing, and even in airplanes there is now a rapid development of racing among very small machines.

To Promote Safety

In order to keep the expense as low as possible, the size should be kept to the minimum. This would naturally be handled by limiting the cubic capacity of the envelop. It might also be advisable to limit the size of the engines to further reduce expense. There probably should be other restrictions to promote safety, such as a minimum amount of disposable ballast and certain minimum factors of safety. The crews should not be less than two men and preferably more. To enable a large number of ships to be handled simultaneously at one field, they should be required to have facilities for attaching to a mooring mast and should be required to be moored to the mast for a certain period before the race—just as the Schneider Cup racers are required to lie to a mooring before the race.

Capacity Limitation

It is not considered within the province of this article to suggest definite limits for the above mentioned restrictions, as they must be determined by a committee after careful consideration of the problem from all angles. However, it is probable that a limit of size might be set at about 50,000 cu. ft. It has been estimated that ships of this size could be produced for about ten thousand dollars.

The race itself must be long enough to give a fair test of the endurance and reliability of the ships,—probably about three hundred miles.

Should such a race be instituted, the benefits derived by all concerned would be considerable. Since the Army and Navy

A Type Which Would Figure in an Airship Race. The Goodyear Pony Blimp

would probably supply the largest number of contestants, their interests should be considered first Such a race would furnish splendid training for airship pilots and crews The fact that the ships are small and relatively inexpensive would enable a large number of entries to be made from both the Army and Navy and, consequently, a large number of men would benefit by the experience and stimulus of the competition

Would Encourage Development

There is little doubt that the types of ships which would be developed would become very useful for elementary training purposes after the race and consequently the money spent in building them would not be wasted From the point of view of development of airships, the race would be of great value to the Army and Navy, since speed is a primary requirement in military ships Such a race would also serve to test out the possibilities of new types, to work out details of handling and to perfect items of equipment just as has been the case in the Indianapolis Race for automobiles and the Pulitzer Race for airplanes

From the point of view of familiarizing the public with the activities of the Army and Navy and arousing their interest in aviation, such a contest would be second to none for the reason that it would be witnessed by so many people and would have such peculiarly spectacular features.

Advertising Value

Next to the Army and Navy, the manufacturers of lighter-than-air ships and equipment would be most interested For them, the spectacular features would be very important, owing to the publicity they would receive by reason of having their ships entered. In fact, since several of the builders of airships are also large rubber manufacturers, they would probably feel that it would be splendid advertising for them to enter ships under their own names, as a victory in the airship race would advertise all their other products

From the point of view of the participants, it would be hard to conceive a contest that would give more real pleasure and joy of living, than to race with a fleet of fast airships over an interesting country, using all the skill and knowledge one possesses It would be like riding in a great steeplechase in which the horses were tireless and swifter than the wind and the hurdles were the mountains and the clouds Such a race would give wonderful exhilaration with little or no personal danger and would undoubtedly develop into a great sporting event which would attract many private individuals.

From the point of view of the general public, the race would be a wonderful spectacle and a very exciting contest The great result to be anticipated from such a race, or rather from a series of such races, is the expectation that it would hasten the development of the airship and bring it more quickly to the point at which it will become a convenient, swift and pleasant vehicle of rapid transport for mankind

The Curtiss Flying Service—New Name

Back in 1910,—way back, as aeronautical progress now proves,—Glenn H. Curtiss and his associates formed a company, an offshoot of their larger manufacturing activities, and gave it a name that indicated exactly what its purpose was, —to exhibit aircraft. For a time that is just what the Curtiss Exhibition Company did, and these exhibitions were largely in the nature of stunts, thrills, circus performances, to be gazed at with awe, but having little practical or commercial value.

In 1925 the very nature of the original purpose changed, and the activities so enlarged that the name is no longer indicative of the service that has been built up The company now has a fleet of over thirty airplanes, manned by a competent staff of pilots and mechanics. The clientele includes the leading newspapers, film companies, hotels, aerial photographic companies, and other leading business concerns in the East From 1920 to July 1925 this service flew approximately half a million miles and carried over 22,000 passengers without serious accident.

It is now no longer an exhibition company, but one well equipped to render efficient commercial airplane service The Curtiss Exhibition Co. announces that on and after Sept. 1, 1925 the company will be known as CURTISS FLYING SERVICE, INC., Garden City, N. Y.

Japanese Air Power

International News Reel
Machine gunner sighting squadron of Japanese aircraft

Remarkable Bombing Accuracy

The office of the Chief of Air Service reports the following: On October 23, during an aerial target bombing practice, 1st Lt. C S Shankle, as bomber, and 1st. Lt. Levi Beery, as pilot, dropped nine bombs from a height of 5,000 ft., seven of them hitting the target and two coming within short distances of the target, which would be considered constructive hits. The 100-lb practice bombs were used The practice took place at Langley Field and the record attained by Lieutenants Shankle and Beery is announced as the best ever made in the Army Aviation Service It establishes a new record.

Standard Atmosphere—Tables and Data

This report is an extension of National Advisory Committee for Aeronautics Report No 147 Detailed tables of pressures and densities are given for altitudes up to 28,000 meters and to 65,000 ft In addition to the tables, the various data pertaining to the standard atmosphere have been compiled in convenient form for ready reference.

A copy of Report No 218, which is by Walter S Diehl, may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C

AIR TRANSPORTATION

ACCOUNTS of air transportation in Europe should be read with interest in this country, but not always taken at their face value The report, for instance, that European lines in 1924, carried nearly 100,000 passengers for a total distance of over five million miles, is of no commercial significance. The percentage of pay passengers is unknown and often kept well concealed. The number of pay flights is also unknown, as well as the number of completed, interrupted and uncompleted flights.

A practical definition of air transportation is the carrying of goods or passengers for pay, by aircraft, from one point to another Reports of total mileage, total number of passengers and tons of freight carried, mean nothing until combined with such items as gross income excluding subsidy, operating costs, insurance and interest.

Subsidized Air Lines Not Commercial

The European air lines emphasize total mileage, passenger and freight statistics for publicity's sake and they have done noble service in educating the public In addition, subsidies are paid on the basis of such totals, the different governments being primarily interested in having aircraft operated, airdromes established, and general activity for aircraft manufacturers, pilots and mechanics. Profits interest the different governments only incidentally, their chief concern being the establishment and maintenance of air power This attitude, of course, cannot be carried into the operation of purely commercial, unsubsidized air lines. The practical commercial guage of air transportation will have to be ultimately based on the passenger mile and the freight ton mile not on padded statistics.

Aerial transportation, to the average American, is a vague thing It is still associated with war and adventure, least of all with every day business Contact brings knowledge, but the only aviation contact Americans have, is with "romantic" aviation—with army airplanes, with air meets where speed, skill and daring are stressed, with newspaper reports of records and accidents Americans rarely associate such terms as "passenger mile" and "freight-mile", with aviation. Aerial transportation, for the average European, also has its romantic side, but it also means transportation—an excellent means of getting quickly from one place to another He sees little of military planes and air meets but he sees a tremendous lot of air liners cruising along on daily traffic routes.

If aviation has not reached the commercial stage, in the strictest sense, it has at least been a huge educating agent, and an air-educated public is the real foundation for air transportation. In western Europe the man is rare, who has not seen air liners passing overhead. Air schedules and rates are posted everywhere, airdromes are overflowing with activity, and posters in hotels, taverns and village inns, tell the public how safe, sure and speedy air travel is, in addition to all its pleasures and comforts.

Much Air Transport—Little Commercial Aviation

The Englishman is a little ahead of us in air-enlightment He has his Imperial Airways, but only Londoners and those in southern England, benefit from that, since Imperial Airways liners operate only between London and the Continent. Commercial aircraft were not frequently seen north of London England lacks the small independent companies, such as we have, the only independent company operating in England last year, being a small concern carrying mail across the Irish Channel. Englishman, however, have an advantage over us in publicity, as all the Continental air lines, as well as the Imperial Airways, carry on a heavy publicity program. The man from Liverpool or Edinburgh has little contact with commercial air liners, but charts and posters keep telling him that air transportation has arrived.

The Dutchman and Belgian may not travel much by air, but there's hardly a peasant, horse or cow that gives more than passing notice to the air liners. Both of these little countries are crossed and criss-crossed by airlines, and the Amsterdam and Brussels' airdromes are alive with aircraft

French air lines, in fact, do more advertising than transportation work, but with great results. It is an interesting fact that all French lines, except for the Casablanca line, run north of Paris, and the north portion of France probably sees more air traffic today than railroad traffic The rest of France, however, is not neglected, as every railroad station, post office and hotel carries posters and schedule notices. The concierge of most hotels, is familiar with the air time tables.

Germany Leads

Germany is the premier aviation country. Air transportation has reached a stage where people are buying stock in air lines, and many towns own a block of stock in the local air line. Publicity has reached model proportions, steamship offices having their windows filled with air displays, with posters displayed everywhere, and newspapers carrying details of schedules and rates. Germans, unlike the French and Belgians, actually travel over their own air lines. Schedules are kept as strictly as our fast train schedules There are few air meets, and no military aviation. The only aviation to be seen in Germany today outside of the glider and light-plane experimenting, is air transportation, with a traffic as real as our railroad traffic.

League of Nations and International Air Traffic

The Traffic Department of the League of Nations may soon have its hands full, if it undertakes to regulate the international air traffic problem in Europe. The aim of this Traffic Department is to re-establish civil air transportation and eliminate, as far as possible, the national boundary difficulties. But Col. Hines, the British representative, has already discovered that air traffic is considered exclusively national by the various countries in spite of the fact that the ordinary air liner operating in Europe crosses two or three countries in its usual flight The Holland-French lines run through three countries, the French-British line through two, the Holland Swiss line through four countries

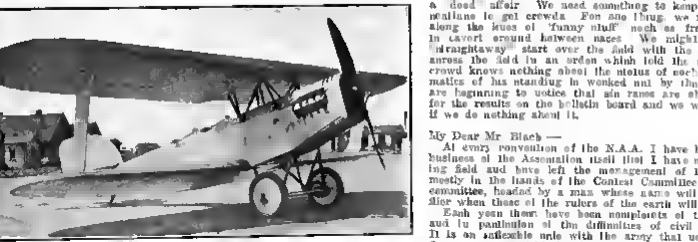
Obstacles to Progress

All of these countries, however, are members International Air Commission and no difficulties have arisen, which the Commission has not been unable to solve. But Germany is proving a stumbling block, and German territory must be covered for all direct routes east France has already had a taste of what might happen in the future. Her Paris-Vienna line was stopped for a time when Germany refused to let French planes fly over its territory from Strassburg to Vienna. In time, traffic was re-established, but by a tortuous and dangerous detour over the Alps, via Switzerland, with uncertain weather in the high passes. Another detour had to be made in the Prague-Warsaw line, the old line cutting directly across German Silesia, while the new line makes a detour to the south. Poland reciprocated by keeping the German planes on the Berlin-Koenigsberg Line from passing over the Polish corridor. The line should run to the Baltic and then along the coast to Danzig, but German pilots still keep the old route, climbing to a five-thousand foot altitude to keep out of rifle shot.

The traffic men at the League find air traffic too much overshadowed by its military importance and their first problem will be to persuade the various countries to treat air traffic as a purely civil medium of transportation and communication.

Napier Engines in Sweden

The Napier "Lion" airplane engine, produced by D. Napier and Son, Ltd., manufacturers of the engines used in the British Schneider Cup seaplanes, continues to increase in popularity in all parts of the world. Characteristic of this it is interesting to note that one of the most recent machines produced in Sweden is fitted with one of these engines. The airplane, the Heinkel-Napier, is a two seater observation machine for general military service. It is of German design but, owing to the restriction on the production of large military machines



The Hunkel two seater observation plane, with 450 hp. Napier "Lion" engine

in Germany, arrangements have been made for the manufacture of this type in Sweden. The design, which, from the photographs, will be seen to be of very simple layout, incorporates an all steel fuselage made up of welded steel tubing.

The top speed of the plane with the Napier Lion engine is claimed to be 152 m.p.h. with a ceiling of approximately 25,000 ft.

Comments on the Air Races

Archibald Black wrote to the President of the National Aeronautic Association, Godfrey L. Cabot, regarding a change in policy. The correspondence which clarifies some of the critical points, is printed below.—Ed.

Now that the hectic days of the National Air Races are past I think that it might be very timely if we myriad some of the ideas and impressions which occurred to us instead of waiting until they are forgotten.

One of the outstanding impressions which I have always carried away from these races which I have attended has been the need for improvement in the method of handling admittance to the area, shared parts of the field. As you probably will appreciate the chief interest in the races among engineers lies in the opportunity which they afford for examination of so many different airplanes. During the race week there are assembled on the field more different types than are found together at any other time. To the engineer this offers an unexcelled opportunity to study and compare design. Therefore from the viewpoint of the engineer the chief advantage of the whole meet is this one feature.

Now as the scheme of things generally works out the general public is roped off in a certain part of the field area and admittance to the pants where the machines are housed is obtainable only through special dispensation of providence—unless the engineer happens to be assembled with some contestant. Not having any personnal association with any one firm I am merely in this class. Many other engineers one left out of it if their first happens to have no entry. It matters not how well known an engineer may be on what firm whom he may represent, if he is not connected with a contestant there seems to be no place for him on the field. It happens that I personally get out on the field of every meet that I have even attended but this is generally unsatisfied only through the most irregular means and sometimes often considerable strain upon time and temper.

To remedy this condition at future races I might suggest that a system be worked out to provide for those who have some reason to being allowed out on the field. It might be limited to within some reasonable hours if necessary but it should be so arranged that this open season happens at a time when the unique number of machines are at the field. If arranged for the day before or for the day after the meet some machines will be missing and but little may be gained. Possibly in the case of a three day meet this courtesy day or visiting day might be the forenoon of the second day. Perhaps we might call it Engineers day.

Another and separate matter comes to mind. The members of the N.A.A. frequently raise questions about "what they get for their money." This is always encountered when one is soliciting new members and frequently arises up when dues-collection time comes around. Of course we have the Review and the meetings and so forth to show but I think that we might add another attraction in the way of reduced admission to meets. The objection may be raised that most N.A.A. members do not have to pay any how on account of being present in some official capacity. If this is correct then we will lose very little in the gate returns. I would suggest that we work out a system of "season tickets" for sale to only N.A.A. members and which allows them to for example pass the gate on all three days for the same price as the public pays for each admission. There might be some trouble through exchange of these season tickets but this could be practically eliminated if they were punched for each entry and the number of punches limited.

Again another point. At the Mitchel Field Meet, we had some very bad weather yet the general public was restricted rigidly to an unsheltered part of the field during the races. This meant absolutely no protection against rain for those who were not blessed by the special dispensation of previously referred to before. The idea of an exhibition hangar is good. Why not merely continue this and leave it open to the public all of the time? Then if it gets cold or if it rains they will have some shelter.

And yet another. Can we not make some effort to hold the races at a more reasonable time of year? We seem to be always forced back into the uncertain part of the fall (I presume that the question of compelling Army and Navy racers generally is more than). If we must hold races at a time when we know there is a chance of it being positively uncomfortable (and having the weather put down and crowd) can we not at least move farther south? If we must move into almost winter, then let us hold our meets in Florida, Georgia or some milder locality.

One more point. As has been said frequently before, an air race is a good affair. We need something to keep interest alive if we are to continue to get crowds. For one thing we might work out more ideas along the lines of "funny stuff" such as frankishly decorated airplanes in covert around between races. We might work out a race with a straightaway start over the field with the idea of having racers pass across the field in an order which told the crowd something. Now the crowd knows nothing about the status of each contestant until the mathematics of his standing is worked out by the neutral nonentities. People are beginning to notice that air races are about as thrilling as waiting for the results on the bulletin board and we will begin to lose our crowds if we do nothing about it.

ARCHIBALD BLACK

My Dear Mr. Black:—

At every convention of the N.A.A. I have been so much occupied with business of the Association itself that I have spent little time of the landing field and have left the management of that end of the Association mostly in the hands of the Contest Committee which is a very competent committee, headed by a man whose name will be remembered as the first flier when those of the rulers of the earth will have been forgotten.

Each year there have been complaints of the management of the field and in particular of the difficulties of civil and commercial entrants. It is an achievable aim with the army that no military airplanes may be flown over any field that is not controlled by the army.

I shall be glad to know whether in your judgment it would be a good plan to have an annual meet of the Association at which no military planes were flown and the races were exclusively between civilian and commercial aircraft. Now in these last races I insisted that there should be a place set aside for the use of civilian airplanes and accessible to the public and to the motorists or friends of the contestants. Did you or did you not go to this part of the field and were you or were you not allowed to inspect civilian airplanes in that part of the field. It is undesirable that any unnecessary pomp should be on any part of the flying field itself.

Your idea of an Engineers Day does not seem to me very practicable because there are so many events that we need all the time there is to handle them to good advantage.

I think that almost any member had to pay for admission. I myself paid for my tickets and I think it right that all should pay who are not actually rendering service such for instance, as members of the Contest Committee. The matter of entrance fees is mostly determined by the local management. It has been found needful not only with the National Aeronautic Association but with its predecessor the Aero Club of America, in many instances financed and managed by some independent corporation, but it would be possible for us to make it a condition in assigning a meeting meet to a particular locality that there should be a stipulated reduced admission fee to our members, and I will place your letter among the agenda to be considered at our next governors' meeting.

I do not believe that at most of our open meets it will be possible to make adequate provision to protect the public in case of rain. Of course, all the races are stopped in case of rain and the public as a rule hastens back to town so that this evil is not as bad as it might be.

The reason the races were so late this year was that the army and the navy notified us that their planes for the Pulitzer would not be ready before October.

We would at a recent governors' meeting to hold our annual meet next year early in September.

We are certainly faced by the proposition that our races are becoming better and better known and that it takes more and more to excite general interest and bring in a great crowd of people. This Association will be very grateful for helpful suggestions as to any possible way of maintaining and increasing the interest of the general public in our meets.

GODFREY L. CABOT,
President, N.A.A.

Imperial Airways Bulletin

Cross Channel Traffic Statistics April 1st, 1924, to August 26th, 1925:

Flights Made	6,750
Milage Flown	1,335,512
Passengers Carried	18,724
Freight Carried	1,098

Type of Freight Carried

London—Paris—Basle—Zurich

Tin ware, gold watch cases, underclothing, pathological specimens, newspapers, gold, machine parts, gloves, marocain, straw plait, aluminum pistons, tools, slippers, pump sprays, clothing, platinum, gramophone records, live dogs, whalebone, ball bearings, enamelled cowhides, artificial flowers, silk, flowers, books, lenses, toilet cream, cotton, whiskey, fish, wallpaper, milk, live show pigeons, tennis balls and racquets, woolen goods, boots, silver, advertising matter.

London—Ostend—Brussels—Cologne

Apparel, boots and shoes, ironware, surgical instruments, fruit, photographic goods, motor parts, aluminum products, umbrellas, chairs, printed matter, tools, toilet requisites, asparagus, pocket knives, twist drills, silks, velvets, cottons, razors, food products, manicure instruments.

London—Amsterdam—Berlin—Copenhagen

Textile furnishing goods, machine parts, aero engine parts, china vases, newspapers, electrical drills, steel transmission chains, chassis parts, cricket bats and balls, live fowls, petrol black, woolen goods, gold, flannel, roller bearings, radio crystals, watch parts, wireless materials, eggs for hatching, chemicals, printed labels, enamelled cowhide, hats, waterproof garments, band cockades, lizard skins, water meters, steel tubes.

Topics of the Month

It is 16 years since Louis Bleriot first crossed the Channel by airplane. Today an average of 1,000 passengers a week fly to and from the London Airport at Croydon across the Channel.

On August 21st an Imperial Airways party consisting of Colonel H. Burchall, D.S.O., and Pilot Minchin left Croydon by air to make a detailed survey of the route between Cairo and Karachi. Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation, will join the party in Egypt and accompany them over sections of the route.

The Cairo-Karachi route, which will form the first stage in an Empire Commercial Air Line, will alone effect a saving of approximately 6 days in the delivery of Anglo-Indian mail. It is not anticipated that passengers will in the first instance be conveyed beyond Baghdad, the Persia Gulf section being mainly confined to a mail express parcels service.

On August 24th, British Commercial Aviation, completed the sixth year of its existence, since the London-Paris aeroplanes began flying on August 29th, 1919, approximately 5,000,000 miles have been flown between London and the Continent by British commercial machines, carrying more than 60,000 passengers. In August, 1919, only 225 air miles were in operation between London and the Continent, today, British machines are flying over 1,400 miles, and this mileage will be increased to 3,800 when the Cairo-Karachi route is open for service. The modern multi-engine 14 seater machines employed on the London-Paris route bear a striking contrast to the small single-engined craft, carrying only two passengers, which were utilised at that time.

A number of occasions have arisen during the recent unfavorable weather which have shown the value of wireless telephony for the safe navigation of aircraft. For instance, three separate Imperial Airways pilots have on different days flown between Croydon and Brussels without sighting the ground from one aerodrome to the other. Keeping in constant touch with the Control Office at Croydon they were safely steered to their destinations by telephone, by means of special direction-finding instruments.

Satisfactory results have recently been attending research aimed at silencing the noise of propellers as well as that of engines. It is not generally realized that the noise of an aeroplane does not arise entirely from the engines, but from the revolving of the propellers.

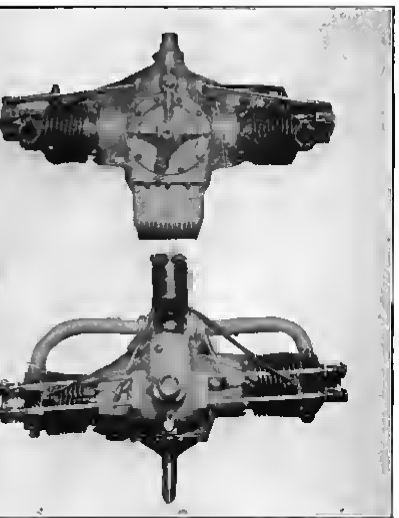
Wright Aeronautical Corp. to Manufacture the Morehouse Engine

Wright Aeronautical Corporation announces that Harold E. Morehouse has joined the Engineering Department and that the Wright Company will manufacture the Morehouse 80 cu. in., 30 hp. air cooled engine and also the double engine, 160 cu. in., 60 hp.

The Morehouse engine finished its tests over a year ago but, in the meantime, due to there being no manufacturer to supply the public with these engines, the light airplane builders could not obtain them. We believe that this announcement will, therefore, be of interest to many airplane builders.

In addition to the 80 cu. in. 30 hp. Morehouse engine, as stated above, plans are being made to build it also as a 4-cylinder engine giving 160 cu. in. displacement and 60 hp. This double engine will have a reduction gear so that the propeller speed will be only about 1250 r.p.m.

The 80 cu. in., 30 hp. engine is a 2-cylinder opposed engine, weighing, dry, 89.5 lb. and developing 29.1 hp. at 2500 r.p.m. The bore is 3¾ in. and stroke, 3½ in. The rated power at normal speed is 28 hp. The cylinders are of cross-grained cast iron, fitted with aluminum pistons. Magneto ignition is used. The crankcase is an aluminum casting with a large opening in the front to permit assembly of the crankshaft and rods, and an oil sump is bolted below the crankcase. The crankshaft is chrome nickel steel, with two throws at 180 deg. The connecting rods are "H" section forged duraluminum with steel backed babbitted bearings. The aluminum pistons have two straight crossed ribs supporting flat heads, fitted with 4 piston rings and the piston pin floats in both rod and piston. Bronze end plugs prevent scoring. Both intake and exhaust valves are tulip valves of cobalt chrome. Ample valve area is provided, as the valves are 1⅜ in. diameter, with



The Morehouse engine. In the top view the engine is seen from the propeller shaft end, while the lower picture shows the engine from above.

a lift of ¾ in. Helical round wire valve springs are used. Intake and exhaust valves are interchangeable. The camshaft is parallel to, and above the crankshaft. Forced lubrication is provided by single gear oil pump located in the rear cover. The oil pump is provided with oil indicator, filter and thermometer fittings.

The performance of this engine, giving a brake mean effective pressure of 115 lb./sq. in. and fuel consumption of 0.513 lb./hp. hr. is excellent. The weight complete is only 3 lb./hp., which is considerably less than the weight of the small water cooled engine. The next step with this engine will be the building it up as a double engine, as referred to above. The arrangement will be one engine placed above the other, with a common crankcase and the crankshafts engaging with a propeller reduction gear centrally located. This engine will develop 60 hp. and, with its reduction gear, will weigh approximately 175 lb. The advantages of a reduction gear on light airplanes with small high speed engines, are obvious and this double engine with reduction gear will fill a long-felt want in airplane power plants.

Plans are being made to build these engines so that they will be available for delivery soon after the first of the year. The design of the engine is such that economical manufacturing methods can be employed and the makers plan to make a very attractive price on these little engines. The price will be so favorable that builders contemplating using three engines on one plane can undoubtedly purchase the three engines required for less than the cost of a single larger engine of equivalent power.

Air Mail Radio Signal Developed

Invisible Beacon, Which Guides Pilots by Day, Night or in Thick Fog Successfully Tested by Air Mail Service.

THE radio beacon system recently described in these columns for guiding airplanes by night or in fog is a success, and, with certain improvements, which will reduce the cost and increase the effectiveness of the transmitting stations, can now be put into practical operation by the Air Mail Service

After nearly two months of constant experimenting and testing under all kinds of weather conditions the Development Division of the Air Mail Service have reported to Postmaster General New that the first stage of the beacon work has been successfully completed and that the plan can be used under actual service conditions.

This report, which has unusual technical significance, coming, as it does, at a time when the rapid extension of the Air Mail Service to all parts of the United States is contemplated, was prepared under the direction of Carl Hempel, assistant radio engineer of the air mail service, and consists of twenty pages of drawings and statements concerning the beacon work, under the title "The Equi-Signal Radio Beacon".

The paper is the first of a series of reports intended as a technical and practical introduction to the Radio Beacon. It contains a summary of the first stage of the work, which was on wave lengths of 807 and 1050 meters, with recommendations for further development work, on an 87 meter wave length

To Aid Commercial Aviation

The object in view in the experiments, according to the report, is to produce a flexible system which will aid air navigation in the Air Mail Service and which will also be of use to commercial flying in general in which a definite route is to be indicated. The system developed does not require the use of additional radio apparatus in the plane, other than the standard receiver. The report tells of the work of building the ground station and the completion of the test flights by which the successful application of the radio beacon will be accomplished.

Working with a transmitter of only 1 kilowatt power, and using only 2-3 kilowatts in a majority of the tests, the beacon has been found to have a range, under fair conditions, of more than 200 miles. With the beacon focused on Indianapolis, two Army planes heard the signals at that distance and were able to follow them to Monmouth. At Chicago the signals were reported as being of medium strength

Other satisfactory flights have been made with the aid of the beacon under various conditions, including the thickest weather. On one trip to Chicago, Pilot Frank Burnside stated that there was less than a mile of visibility on either side of the plane, but that it was a very simple matter to stay on the course and that the absence of the burden and strain of looking for landmarks was a great relief. All he had to do in the plane at 2,000 ft from the ground, was to watch his instruments, and fly

Used in Any Direction

In addition to being practical for flights along the normal course established by the two beacon loops, it is possible to focus the beacon on any objective, within its range, and to dispatch an airplane and know that it will not get off the course. This is made possible by the use of a special goniometer, developed by the Signal Corps radio laboratory at McCook Field. By the use of this instrument the direction of the beacon signal can be changed from Chicago to Indianapolis, or any other point, in a very few minutes

Improvements have also been worked out in the method of reception of the signals by the pilot of the airplane. An interlocking signal system is used and when a constant signal, consisting only of dashes, is heard the pilot is certain that he is on the proper course. If he veers to the right he will hear only the letter "N", which consists of a dash and a dot, and if he veers left he will hear only the letter "A", which consists of a dot and a dash. He can alter his course accordingly and return to the proper line of flight.

It is understood that experiments are to be undertaken soon to develop a visual control system, by which the pilot can keep on his course by merely watching an instrument on his instrument board. At McCook Field has been evolved a system of three lights located on the instrument board. A white center light is illuminated when the plane is on its course, and red and green lights indicate that it is veering to right or left. Another system proposed is a device similar to the ammeter used on ever year, which will show the course directly. When the indicator is centered the plane will be on its course and the hand will point right or left when the ship veers in any direction.

List Three Objections

In concluding the report three objections to the radio beacon, as at present developed, are made. First, the cost of the installation would be about $6,000 and it would be necessary for every field to have a station; second, the physical dimensions of the present loop antennas employed, are such that they would be a hazard to any landing field; third, the interference of static on the wave lengths now employed, 807 and 1050 meters, is very much greater than on short waves.

It is recommended that an investigation be made of the possibilities of the radio beacon at wavelengths below 100 meters, where a minimum of static will be found, and small loop antennas can be used and where a stronger signal with less power can be achieved. Cost of the installation can be greatly reduced, it is said, by the use of a wave length around 87 meters.

The report also includes an interesting history of the development of the radio compass, predecessor of the radio beacon, which was started by the Germans as early as 1907 and used during the war by their navy and for the guidance of Zeppelins. Photographs, drawings and a lengthy report on the equipping of the radio plane and the method of shielding developed at McCook Field, is also presented. Great credit, according to the report, must be given W. H. Murphy and associates of McCook Field and F. W. Dunmore, physicist of the Bureau of Standards at Washington, for their cooperation in the recent development work.

Bids for New Air Mail Routes Called For

By direction of the Postmaster General an advertisement has been issued inviting bids for the operation of two new contract air mail routes. These routes are open to bidders regardless of residence

The schedule has been prepared, requiring an average flying speed of approximately 90 m.p.h. The Department realizes that in some instances, due to weather conditions, etc., it may be impossible to maintain such an average but on the other hand when conditions are favorable it may be possible to cover the distance in even better time. Proper allowance will be made in all such cases. Details of the services follow:

CHICAGO, ILL., BY MILWAUKEE, AND LA CROSSE, WIS., TO ST. PAUL AND MINNEAPOLIS, MINN., AND RETURN

Round trips required—not more than six per week. During that portion of the year when daylight hours are shorter, the schedule may be changed so as to permit daylight flying over the entire route

Leave Chicago on arrival of plane from New York due at 5.45 a. m. Leave Milwaukee 7.10 a. m.; Leave La Crosse 9.20 a. m. Arrive St. Paul-Minneapolis 10.40 a. m. Leave St. Paul-Minneapolis 2.40 p. m.; Leave Lacrosse 4.10 p. m.; Leave Milwaukee 6.20 p. m., Arrive Chicago 7.15 p. m.

CHEYENNE, WYOMING, by DENVER, AND COLORADO SPRINGS TO PUEBLO, COLORADO, AND RETURN

Round trips required—not more than six per week.

Leave Cheyenne 5.35 a. m.; Leave Denver 6.60 a. m.; Leave Colorado Springs 7.50 a. m.; Arrive Pueblo 8.30 a. m., Leave Pueblo 4.15 p. m. Leave Colorado Springs 5.05 p. m.; Leave Denver 6.00 p. m.; Arrive Cheyenne 7.15 p. m.

Proposals should show rate of compensation stated in percentage of revenue, which must not exceed 80 per cent of the revenue as mentioned in the law.

The postage rate over contract air mail routes is 10 cents an ounce or fraction thereof where the length of the route is not over 1,000 mi., 15 cents up to and including 1,500 mi., with 5 cents additional for each zone traveled on the transcontinental government operated route

Proposal blanks may be obtained from postmasters on the routes or from this office

Engine Encyclopedia

DYKE'S AUTOMOBILE AND GASOLINE ENGINE ENCYCLOPEDIA. Edited by A. L. Dyke. 14th Edition. 1,240 pp. 4,200 Illustrations. Indexed. The Goodheart-Wilcox Co., 2009 South Michigan Ave., Chicago, Ill. Cloth $6.00. Flexible Binding $7.50

The most noticeable additions to the new addition of this comprehensive volume are several colored charts. In the section where troubles are treated, a sixteen-page form has been added with four large colored trouble-shooting charts, one being that of a complete ignition system. Other colored charts show a complete fuel feed and carburetion system, a generator and its circuits, and the starting motor and its circuits

A. L. Dyke, editor of the encyclopedia, who is a pioneer in the automobile field, has changed 512 pages of this, the first edition of the world-famous book since 1922. And 221 illustrations have either been changed or new ones substituted. The index has been enlarged and about 1,200 lines added, making over 15,000 lines.

The entire scheme of the book is such that it makes the most technical subjects appear simple and easily mastered. The book does not contain a lot of mathematics or engineering formulas. Far from it. The reader is unconsciously led from simple principles to the more complicated processes. As he advances, he has the groundwork to enable him to understand. Nothing is discussed that is not first explained. The book is like the automobile itself. As a complete machine, it is a complicated product. But to the one who has learned how to build it, part by part, it is a simple affair. So with the book itself. To him who reads it painstakingly and carefully from the very beginning, each subject is made so plain that he is unconsciously ready for the next.

Moreover, the method makes each subject interesting. As the reader progresses from page to page, he is eager to learn more and more. Here is where the book accomplishes its greatest mission; it shows how to go about learning any subject connected with the automobile. It starts with fundamental principles; it works up as it goes along, it teaches the reader to think and to reason, and to use the brain more and the tools less.

The book is specially unique in this particular. Many thousands have learned from it to use their mind and their own brains. They have told others about it, about its usefulness and its helpfulness—and in this way the book has earned its reputation. The sale of this book is now enormous—principally due to the advertising it has received from its friends and satisfied readers.

It has been the purpose of Mr. Dyke, in compiling this book, to divide the car into component parts, giving diagrams of each, just as physiology would divide man's anatomy into bone, muscle, blood, and nerve systems. This book not only teaches the fundamental principles of each and every unit of a car, but it is a course of mental training, so that when a difficulty does arise and the user is called upon to "think for himself," his thoughts will take the shortest and most direct ent to the thing that needs to be done.

This book is the outgrowth of the first practical automobile trouble and remedy book published in America, which also was written by A. L. Dyke.

During the War the book was used extensively by institutions all over the United States in training motor mechanics for government service, and it was sanctioned for use in the Schools of Military Aeronautics in England.

"Dyke's Automobile and Gasoline Engine Encyclopedia" is of benefit to the car owner, the chauffer, the student, the beginner or apprentice, the instructor in schools, the repairman, to service station manager and garage owner, the automotive electrician, the storage battery repairman, the trouble shooter, the automobile salesman, and in fact to everybody interested in automobiles. Nowadays that includes almost everyone.

New Inserted Tooth Saw and Groover

The Disston Ideal Saw and Groover, a new power saw manufactured by Henry Disston and Sons, Inc., should prove of interest to aircraft manufacturers. It is an improved saw in which the inserted tooth principal is employed for the production of grooving, molding, heading, tenoning, etc. The teeth, of special high-speed tool steel, are locked in sockets

The Disston Adjustable Tooth Saw

arranged spirally in the blade and any tooth can be inserted or removed in a moment. Teeth may be had with any form of cutting edge, so that by choosing the proper tooth any desired shape or size of groove or slot can be cut. This enables the user to build up a saw for his special requirements or the work in hand and to change it at will.

Compensation for Wearing of Teeth

The teeth are set in the blade to provide clearance without swaging or setting. This insures that regardless of the amount of wear they will always cut the same width groove. Wear on the teeth is compensated for by moving the teeth outward 1/16" or 1/32". A rack cut in the tooth fits a special lock and provides exact adjustment without troublesome measurements. With this type of saw, a tooth of such hardness and toughness can be used that, when sharpening is necessary, they are not filed but touched up in the saw with a whetstone or removed and sharpened on a grinding wheel. Nothing is touched but the teeth, in sharpening or adjusting them and their width and clearance always remain the same. The blade never changes in diameter as it does when an old style saw is sharpened. New teeth, or teeth of a different pattern can be inserted without removing the saw from the mandrel.

AIRPORTS AND AIRWAYS

Air Meet, McKeesport, Pa.

By Ray A Tucker

Ten thousand people witnessed a spectacular Air Meet at the McKeesport Airport on Sunday, Oct. 18, given under the joint auspices of the Burt Foster Post No 361, American Legion and the owners of the field, Clifford Ball and D. Barr Post The Aero Club of Pittsburgh assisted in handling the program

Twenty-eight planes, listed below, of which twelve were commercial, nine Army, and five Reserve Officers Training took part.

Commercial airplanes—A H. Kreider, Hagerstown, Md. Waco; S R McIlwain, Pittsburgh, Pa. Waco; E E Tracy, St Joseph Mo. Laird Swallow; D A. Askew, Ardmore, Okla. Canadian Curtiss JN; Basil Rowe, Keyport N J.; S V.A. Shank & McMullen, Huntington, W. Va. Lincoln Standard; Mayer Aircraft Co., Bridgeville, Pa., Mayer Oriole; Mayer Aircraft Co., Bridgeville, Pa., Standard; Mayer Aircraft Co., Bridgeville, Pa., Laird-Swallow; L. C. Feurel, Pittsburgh Pa., Curtiss Oriole; Walter Beech, Wichita, Kan., Travel Air; F F Bowlen, Oklahoma City, Okla. Travel Air

Army airplanes—Lieut R. C. Moffett, Douglas Cruiser; Lieut A. R. Bolk, Douglas Cruiser; Lieut. G P Tourtellot, DeHeviland; Lieut J. T. Hutchinson, Vought; Lieut E L. Enbank, Vought; Lieut. E H Barksdale, DeHeviland; Lieut. R W. Douglas, PW8 Pursuit; Lieut. T K. Mathews, PW8 Pursuit; Lieut G F Shulgen, PW8 Pursuit.

Reserve Officers Training Airplanes—Five Curtiss JN4Ds with Hisso engines located at Rodgers Field, the Pittsburgh Airport under command of 1st Lieut. Royal B Lea, Officer in Charge.

The Weatherman fortunately turned out a good clear day for flying, following a week of rain, and thus afforded the program to work out smoothly under the management of the Aero Club of Pittsburgh, members of which acted in the following capacities as Race Officials.

Joseph M. Sletes, Referee; Alexander V. Wasson, Announcer; Joseph C. Wilson, Jr. Chief Judge; Robert Hancock, Louis Lawrence, Theodore Tacey, Robert Wentz, Assistants; Lewis F. Sevier, Chief Starter; Arthur P. Shane, Loren E. Rehrer, Assistants; C. Glenn Hunter, Chief Timer; Berire u H. Sowers, Jr., Paul M. Sandberg, Lawrence A. Wilson, Assistants; John P. Morris, Field Marshall; Edward Nero, Harry F. Ryan, Frank Kinnard, Assistants; Roy A. Tucker, Clerk of Course.

Program and results scrabble contest—First Prize, $100.00 D. A. Askew, Canadian Curtiss; Second Prize, $50.00 K. E. Dake, Mayer Aircraft's Swallow; Third Prize, $25.00 Basil Rowe, S.V.A.

Parachute jump by Hornus Skellon

25 mi. race for commercial planes less than 150 hp.—First Prize, $250.00 A. H. Kreider, Waco; Second Prize, $150.00 S. R. McIlwain, Waco; Third Prize, $75.00 E. E. Tracy, Laird Swallow.

50 mi. race—Commercial Free for All—First Prize, $250.00 Basil Rowe, S.V.A.; Second Prize, $150.00 Merle Meltrup, Mayer Oriole; Third Prize, $75.00, A. H. Kreider, Waco.

Army exhibition under direction of Lieutenant Tourtellot. Formation and stunt flying by PW8 Pursuit Ships and Sky Writing demonstration by a Vought, being the principal features. This was a wonderful exhibition and every witness got a thrill.

Rodgers Field Reserve Officers Race—First Prize, $150.00 Lieut. Kenneth Lovejoy; Second Prize, $100.00 Lieut. John A. Fite; Third Prize, $50.00 Lieut. Theodore Taney; Fourth Prize, $25.00, Lieut. Halsey Bailey; Fifth Prize $25.00 Lieut. Robert Laedlein

New England Notes

By Porter Adams

Word has been received that the annual meeting of the Aero Club of Maine will be held at the Elks Club, Portland, Maine, on Saturday, October 31st, at 6.30 p.m. The Aero Club of Maine is an organization created for the purpose of encouraging the use of aircraft for sport and commercial purposes. The present officers are: William H Turgeon, President, Dr. Albert Johnson, Secy. and Treasurer, Governors: Palmer King, Herbert T. Horne, Philip H. Lovett, Ernest B Johnson, Clifford Strange, William H. Turgeon, and Dr. Albert Johnson.

In connection with Maine, an important step has been taken in the development of aviation at Bangor by the sale of the big aviation field formerly owned by Charles W. Morse and located between Hyman St., and the main highway to Boston, being purchased by Edward R Godfrey, a Bangor capitalist, who is deeply interested in aviation and has done considerable flying in Europe. Mr. Godfrey incidentally, is a classmate and a close friend of Donald MacMillan, of the Polar Flight. Mr. Godfrey has leased the land to Lieutenant Lowell, who plans to develop the place, erect hangars and operate a school. The entire plot consists of 89 acres and is the same site where two years ago the bombing planes made their headquarters when visiting Maine.

During the last week, the regular and reserve forces of the Army operating from the Boston airport, made a total of 57 flights with a total time of 1220 minutes. Major Longanecker and Frank Crowley flew to Hartford on Saturday for the local show, while Lieutenant Wells flew to Mitchel Field and returned the same day.

The National Guard flew only four days last week for ten flights, with a total time of 445 minutes.

At squantum, the Navy made 46 flights with a total time of 2620 minutes and the pilots included: Lieutenant Commander Davis, Lieutenant Thomas, Aviation Pilot Frank, Lieutenant Green, Lieutenant Clayton, Ensign Wix and numerous others.

All of New England, both Army and Navy rejoice in the victory of Lieutenant Doolittle in the Schneider Cup Race. Lieutenant Doolittle for two years took the Aeronautical Engineering course at the Massachusetts Institute of Technology and last June received his Degree of Doctor of Science. Lieutenant Doolittle did a large amount of flying and made many friends during his stay in Boston.

Mexicans Buy Airplanes From California Factory

By C. K Spencer

"El Condon del Rio Mayo" is the service christening of the first big plane sent from the Ryan airport at San Diego, Col., to the mouth of the Mayo River, in the Gulf of California, near the little Mexican town of Navojoa, in Sonora. It represents the actual inauguration of commercial aviation in western Mexico, and the name signifies, "The Condor of the River Mayo."

Mexico, as a market for American commercial airplane manufacturers, has been gradually coming to the fore, but with the establishing of the Mexican west coast airways, the first orders are now reaching California aircraft builders. It is also significant of the real feeling of friendship between the two countries. And it further proves that Mexicans have faith in the desire of their countrymen to fly and to use the air. Mexico, like the United States, is a land of great distances, peculiarly suited to navigation by aircraft, and over which aircraft will have an exceptional opportunity of demonstrating economy of travel by air.

The Ryan Standard Ready to Start for Mexico

"The Condor of the River Mayo," has been delivered at Navojoa, Sonaro to the Byarly Hermanos Company for operations along the Gulf of California and between Mexican points through the Sierra Madre Mountains.

The Condor was placed in the hands of pilot Gordy Boyd, by the Ryan-Mahoney aircraft firm at San Diego recently, and Pilot Boyd flew it over the International frontier along the Gulf for five hundred miles, making a perfect landing at Navojoa. It is a four passenger Ryan Standard with a 180 hp. Hispano Suiza engine. This plane made the entire flight to Navojoa in one continuous passage, in a total time of seven hours.

At the Navojoa terminal of the flight, the Mexican populace and officials of the flying company greeted Boyd as the precursor of aerial traffic in western Mexico, marking an epoch which may see all western Mexico traversed by aerial transportation systems.

Both Ryan and B. Franklin Mahoney, his partner, are still in the early thirties, yet they have succeeded in establishing the only daily passenger route for aircraft in America, the Los Angeles-San Diego Airline, which is now operating planes at a rate actually lower than the European lines which are under Government subsidies. The Ryan-Mahoney line has only its own revenues, from passengers and plane construction, upon which to depend. Hitherto, it has considered only the Southwestern United States as its market and operating field, but recently has been forced to view Mexico as an extremely favorable aeronautical possibility.

Philadelphia News

By C T Ludington

Last week Pitcairn Aviation flew a formation over the city dropping parachutes and advertising matter for the annual campaign of the Welfare Federation. A most effective streamer attached to a parachute and bearing the words "I care" was used. Much praise of this novel stunt has been heard on all sides.

Harold Pitcairn last week took delivery of a Waco "Nine" from the Ludington Exhibition Company. This is the ship that was entered by the latter company in the Glen H. Curtiss Trophy race at Mitchel Field, placing fourth, thus defeating all stock ships in the race. All at Pine Valley will miss this ship badly as it was used throughout the summer as a demonstrating ship, and had shown repeatedly its ability to show up all comers of equal power.

Victor Dallin has left for Florida to handle a mapping contract near Miami. John R. Thropp has been putting in considerable time on his Swallow. Winston Gee of China, soloed at Pine Valley in his new Canuck which he built early this summer out of entirely new parts. Its fuselage is somewhat shorter than normal which may or may not account for its very excellent performance, which is materially better than that of any Canuck that has yet been seen around these parts.

Cy Caldwell came in this week from Cleveland in his "commercial" airplane to take a new type Victrola out to Cleveland. After the usual bad weather delays in the mountains he arrived at Pine Valley only to discover that his airplane did not have sufficient space to carry a Victrola inside. He therefore pulled out with the "orthophonic" strapped across the two upper longerons in place of cowling. His vision must have been remarkable.

A small B.B.T. flashing beacon has been erected on the roof of the Atlantic Refining building in Philadelphia. It flashes four seconds on and four seconds off, and should be visible twenty or more miles. It is hoped that this may be a permanent installation. From this beacon the flasher at Pine Valley can be picked up by flying an exactly South Easterly course. The Pine Valley beacon has at present a temporary flasher but has been picked up from the ground as far away as Mt Holly. From the air it should be visible from the Air Mail field at New Brunswick. When the permanent flasher has been installed notices will be sent out giving the exact characteristics of this and other lights it is planned to erect near Philadelphia.

Decatur, Illinois

Cy Caldwell writes of "food and flies" on the "Ford-ing Tour." Roscoe Turner spoke with much sadness on the "Tennessee Laws" but they "ain't heard nothin' yet." Our bank cashier shot himself. That was all right—but it was after he had spent our money, and now, to make everything even worse, it snows. Cy is lucky; he could eat and Roscoe could "meet" our banking laws. We guarantee to deliver the snow, f.o.b. Decatur.

On top of it all, we had Bill Robertson, (one of the famous brothers) "knickers and all" as a visitor, last Sunday morning. Fine time to visit—on Sunday morning. Bill is earnestly pursuing the Chamber of Commerce in all cities that lie close to the Chicago-St. Louis Airways to establish "Shuttle-lines" into Springfield. Answer is, Bill gets sixty-seven and one-half per cent of said postage—maybe.

Clevenger brought Al Royster's Avro into the Airport to have a new Clerget installed.

Lieutenant Morrison of Fort Riley, Kansas, landed and "gassed" for Kansas City.

Dick Knox landed with a Standard and took "Hen" Nemyer's girl for a "hop" and had a forced landing. When last seen, "Hen" was busy cranking up a "Jenme" and making pointed remarks concerning Standards and all Standard pilots—one in particular.

Decatur Aircraft Company sold a Standard Special to J. E. Wojton of North Chicago. The plane is to be equipped for night flying. The shop is busy building up Hisso engines on order.

If the bank "pays off", it stops snowing, and "Hen" finds Knox, everything will be "hon."

Yackey Checkerboard Field, Forest Park, Ill.

By Thos. J. Brown

Captain Holberg and Hurd are tuning up their Hisso Standard and are waiting for a nice clear day so that they can finish a 50 hr. photographic contract and, believe you us, they are sure champing at the bits to go, all dolled up 'n' everything. "Cap" says that they are going to Florida as soon as possible.

Miss Malec, a well known Chicago girl, is now one of the Yackey pupils for a flying course together with an apprenticeship in the Yackey aircraft factory. She is really interested and is just naturally air-worthy. Her parents are very much interested in seeing that she learns all about it. Which all goes to show that the general public is taking an interest in learning to fly. While Miss Malec is only 18 years old she is learning much more rapidly than the average man of 25 years and her enthusiasm is inversely proportional to her age.

The Four Horsemen, i. e. Meyers, Radoll, "et al" have returned from their summer of harnstorming at Baraboo, Wis. where a good time was had by all. They are now holeing for the winter.

"Tony," our boss, says that it won't be long before people and aviators will forget to "hole-in" their airplanes for the winter, just as we have long ago forgotten to "hole-in" our automobiles. Um business, thank goodness, is not dependent on the elements any more than the automobile business, even less so.

San Diego, Calif.

By Tam Mathews

It must be the climate, for city ordinance No. 10035, passed on the 22, last, regulating aircraft and traffic in the air, creating a board of air control for the city of San Diego and fixing its duties and powers, defining and prohibiting stunt flying, and the operation and use of aircraft over and within the city of San Diego, is finally going into effect.

The council must have been reading Ryan's ad in AVIATION "the city of a thousand planes", and decided to do something about it. It's a great world, if you have an operator's license, remarked one of the boys, trying to locate the necessary five dollars. And it is, at that.

Speaking of Ryan, reminds me that he returned from New York the other day after having flown there to the Pulitzer races from San Diego. He covered practically the entire distance by airplane with the exception of a stretch in Missouri. It was about the time of the Ford reliability tour and I guess he figured it was safer on the ground.

The company (Ryan Airlines) presented him with a big twelve passenger cabin airliner upon his return, to let him know that they were all with him, and the plane has been drawing crowds ever since. It is powered with a Liberty 12-400 hp. and traveled at a speed of 110 m.p.h. the day I was up.

UNITED STATES AIR FORCES

U. S. ARMY AVIATION

Santa Monica Celebrates First Anniversary of World Flight

A crowd, variously estimated at 15,000 to 25,000 persons gathered at Clover Field, Santa Monica, Cal., on September 27th to witness an Aero Meet staged by the American Legion to commemorate the first anniversary of the completion of the Around-the-World Flight. The principal event was a race around a 100-mile circle course for the $10,000 American Legion Trophy. The Navy won first honors in this event among a field of 24 competitors. Lieut. E. B. Wilkins of the Naval Air Station, North Island, San Diego, Cal., piloting a Vought plane, completed the course in 40 min., 35⅘ sec., or at an average speed approximating 150 m.p.h.

Additional thousands watched the planes at Long Beach, Griffith Park and Van Nuys, judging stations on the course. The race was only one feature of the big day. Nearly 100 planes of virtually all types were on the field.

Flyers of the Army, Navy, Marine Corps, National Guard, Forest Service and civilian pilots vied for honors in the race commemorating the successful completion of the world flight at Clover Field. Planes were entered from Rockwell Field and North Island at San Diego, Crissey Field at San Francisco, Kelly Field, Texas, and from nearly a dozen Southern California cities.

A pretty turn that saved seconds gave Lieut. Wilkins a start that enabled him to win the race. His Vought plane was under way as the starter's white flag hit the ground and was roaring wide open down the take-off straightaway. Lt. Wilkin's observer was F. W. Watson, Machinist's Mate, 1st class. The winner of the $10,000 trophy was presented the cup on September 26th at a banquet and ball in the La Monica ballroom. His name will be inscribed upon the permanent cup, which is to be in possession of the Aeronautic Association Chapter.

Lieut. C. V. Haynes, with Staff Sergeant John W. Yates as observer, won second place in the century circuit. Their time in a standard Army De Haviland with a Liberty motor, was 40 min., 51⅘ sec. Lieut. Haynes and Staff Sergeant Yates flew down from Crissy Field to take part in the contest.

Lee Shoenhair, also piloting a De Haviland, owned by D. E. McDaniel of Pasadena, took third place. His time was 41 min., 46 4-5 sec. Fourth in the event for planes of class 1 machines of 150 hp. or more went to Lieut. F. R. Buse, piloting a Vought from the Naval Air Station at San Diego. His time was 42 min., 12 4-5 sec. He was the first pilot to take off in the 100-mile race. Charles N. James, flying a De Haviland entered by the U. S. Forest Service, took fifth place, time 42 min., 21 4-5 sec.

The results of the winners of places in Class 2, 150 hp. or

less, was as follows:

1st Place	Earl Daugherty (Pilot)	Long Beach	Time 48 min	7-4/5 sec
2nd Place	E. E. Montijo (Pilot)	Long Beach	" 49 Min.	39 sec
3rd Place	Lt. F. O. Barber, AS Res. (JN3)	Army	" 53 Min.	8-2/5 sec
4th Place	Lt. "Bob" Lloyd, AS Res. (JN3)	Army	" 54 Min	2-4/5 sec
5th Place	Lt. H. Claiborne, C.N.G (TW3)	Army	" 54 Min	45 2/5 sec.

Besides the American Legion Trophy, thirteen awards of merchandise orders totalling several thousand dollars, were given to the winners, following the banquet at the La Monica Ballroom. The meet was held under the auspices of the South California Chapter of the National Aeronautical Association, in cooperation with Clover Field and the Santa Monica Post of the American Legion, together with city officials. It is planned that the world flight celebration will be an annual event in commemoration of the achievement of the World Flyers.

Night Flying in the Philippine Islands

Some instructive and successful work in night flying in the Philippines was recently accomplished by the 28th Bombardment Squadron, stationed at Camp Nichols, Rizal, P. I. The instructors in this important work were Lts. Delmar H. Dunton, A.A. Kessler, and H.P. Rush, Air Service, U.S.A. DH4B's and Martin Bombers were the planes used.

The flying was carried out with the new landing-light equipment, field light sets being installed only for use in case of failure of the flying equipment. The Martin landings were apparently as good as those made in daylight. The night landings in DH4B's were slightly more difficult, but no trouble has yet been experienced.

Lieuts. Myers, Skanse, O'Connor, Gross and Snavely soloed on Martins, while Capts. Beam, Eagle, Lieuts. Harper, Powars and Landers flew DH's at night.

Air Service Men Finish Study of Engines

Six members of the Air Service pursuit group stationed at Selfridge Field, Mich., will complete a six weeks' course of instruction in motors Nov. 2 at the Curtiss Aeroplane & Motor Company. They are: Mstr. Sgt. Harry P. Carnean, Tec. Sgt. George C. Goff, Staff Sgts. George Callaghan and Joseph Seeley, Sgts. Jack B. Henley and Joseph Bohrat.

Shipments By Air

Some idea of the success attained in shipping merchandise by Army airplanes may be had from the fact that a total of 2,808 lb. of miscellaneous spare parts and supplies were shipped by air from the Middletown (Pa.) Air Intermediate Depot during July, August and September last. Of this total, 2,600 lb. were shipped in Martin bombers in five trips. Of the remaining 208 lb. of supplies, 200 were carried in DH4B's.

Army Air Orders

First Lt. Frank M. Bartlett, A.S., Kelly Field, to Berkeley, Cal.

First Lt. Thomas K. Matthews, A.S., Selfridge Field, to Seattle.

First Lt. Ronald A. Hicks, A.S., Mitchel Field, to Com. Off., Sec. Corps Area, New York City.

First Lt. Gilbert S. Graves, jr., A.S., 77th Div., New York City, to Mitchel Field.

First Lt. Frank M. McKee, A.S., Scott Field, to Norton Field.

The promotion of Capt. Paul Theodore Bock, A.S., to rank of Major and Sec. Lt. John Ferral McBlain to rank of First Lt., is announced. Maj. Bock and Lt. McBlain will continue in present duties.

First Lt. Malcolm N. Stewart, A.S., designated as model airway communications control officer in addition to other duties.

Sec. Lt. Sheldon B. Edwards, A.S., Kelly Field, to Scott Field.

First Lt. George A. McHenry, A.S., Brooks Field, to Kelly Field.

Spec. Or. No. 244, amended to direct First Lt. Fred C. Nelson, A.S., to proceed to Brooks Field.

Spec. Or. No. 158 amended to direct First Lt. James C. Cluck, A.S., to proceed to Galveston and sail Nov. 30 on transport for Canal Zone.

Will Fight Big Air Fund

Notice that the national headquarters of the Reserve Officers' Association, "speaking for nearly 100,000 reserve officers," proposed to fight in the next Congress any proposal from the Budget Bureau to increase appropriations for the Army Air Service at the expense of other branches of the Army, was given today by John Ross Delafield, a reserve Brigadier General and President of the association.

"It is believed that the budget officials plan an appropriation for the Air Service exceeding any previous peace-time figure," General Delafield said. "As the total amount of the War Department appropriation has already been fixed, it is apparent that if such a move is carried through the result can be nothing but disastrous. The size of our already pitifully small Army will be reduced."

Planes Patrol Canadian Border

Aided by an airplane patrol, United States customs officers along the Manitoba boundary are waging a vigorous war on liquor runners and persons seeking to evade the immigration laws. The border patrol is very effective and, it is declared, has cut rum-running considerably, although evasion of the immigration laws has created a big problem.

During recent weeks a fast airplane has been seen by residents on the Canadian side of the border skimming along the line, spying out nests of "bootleggers" or watching the unwary automobile driver in an attempt he may make to cross the line by avoiding the regulations.

Bans Sunday Air Meets

Following protests received from various civic organizations and from individuals, the War Department issued an order on Nov. 4 prohibiting the holding of any military aviation meeting or aerial demonstration on Sundays for the purpose of raising funds.

The order has been communicated to the chiefs of all branches and bureaus of the War Department and is to become effective immediately.

Exceptions to the ruling are made in the case of individual flying, either on cross-country flights, at airdromes, or to complete missions begun on weekdays. It is further stated that the ruling shall not be construed to interfere with recreational activities and sports held at military posts on Sundays at the discretion of the commanding officers.

In making this announcement the following policy was set forth:

(1) That an air meet (otherwise known as an Air circus) is defined as follows: A concentration of aircraft participating in an advertised aerial demonstration held for the purpose of raising funds, or held for the purpose of providing an additional attraction to some other enterprise which is conducted for the basic purpose of advertising or raising money.

(2) That the participation of the aircraft of the Regular Army or Organized Reserves in Air meets, or air circuses, as defined above is restricted to days other than Sundays.

(3) That nothing in this policy shall affect individual flying, either on cross-country flights, at airdromes, or to complete missions begun on a week day.

(4) That nothing in this policy shall prevent personnel of the Regular Army or Organized Reserve Air Service from assembling on Sundays and conducting such flying or manoeuvres as their commanding officers may authorize, provided such flying does not fall within the spirit or meaning of an air meet as defined above.

(5) That nothing in this policy shall be construed to interfere with recreational activities and sports, held at military posts on Sundays within the discretion of the commanding officers thereof.

Copper Tanks Substituted for Aluminum

The modified H-16 type flying boats used by the Navy at the Coco Solo Air Station, C. Z., are having copper oil tanks installed in place of the aluminum ones now in use.

Parachute Leap Saves Two Aviators

On Nov 8 two Army aviators, Lieut. J. R. Hawkins and his mechanic, Peter Varlashkins, were forced to take to parachutes when their airplane was badly damaged in a wind storm near Moorestown Manor and crashed. The men, jumping clear of the wrecked plane as it nose-dived toward the ground, escaped without injury.

Lieutenant Hawkins and Varlashkins are stationed at the army flying field, Langley, Va, and were returning there from Mineola, L. I., when they ran into the storm. Density of the clouds caused Lieutenant Hawkins to lose his bearings, and he attempted to fly to a lower altitude. The airplane had been fighting its way into the teeth of the gale when the machine went out of control, spinning into a nosedive. Twisting helplessly in the grip of the storm, the left wing snapped and one of the propeller blades was broken. When the machine was within close distance of the earth the aviators jumped, their parachutes opening when they had dropped to within twenty feet of the ground. The plane fell in a cornfield while the two men landed safely.

Visitors at Chanute Field, Rantoul, Ill.

The following extract from letter from the Commanding Officer, Chanute Field, is published for the information of all concerned.

There has recently been a smoke stack, approximately fifty feet high, erected at the Consolidated Mess heating plant, located on a small building immediately south of wooden hangar No. 3, near the west end of the line of buildings and separated from same by the South Hangar road. This is a permanent installation and has been marked with a red light.

Navy Air Orders

Lt. Charles J. McCarthy det. Bu. Aero. to Nav. Aircf. Fact., Navy Yard, Phila.

Carp. Lars J. Larson det. Nav. Aircf. Fact., Navy Yard, Phila., to Inspector Nav. Aircf., Douglas Air Corp., Santa Monica.

Gun. Berrie H. Jarrett det. Torp. & Bomb. Plane Sqdn. 1, Aircf. Sqdns., Setg. Flt., to Aircf. Sqdns., Setg. Flt.

Lt. Ernest M. Kanyon det. Nav. Trng. Sta., San Diego to Nav. Air Sta., San Diego.

Lt. Walter I. Mmoqitz det. Nav. Air. Sta., San Diego, to Nav. Trng. Sta., San Diego.

Carp. Charles S. Kimbrough det. Nav. Air Sta., Pearl Harbor, to Rec. Ship, San Francisco.

Lt. Comdr. Earl W. Spencer det. Off. Nav. Intell., Navy Dept., to temp. duty, Nav. A. Sta., Pensacola.

Lt. Osborne Hardison det. Army A. Sta., Selfridge, to Naval Academy.

Ens. Robert H. Rodgers det. Nav. A. Sta., Pensacola, to U.S.S. California.

Lt. Comdr. Martin Griffin det. Aircf. Sqdns., Battle Flt., to VT Sqdn., 2, Aircf. Sqdns., Battle Flt.

Lt. (jg) Eaton A. Booth det. Aircf. Sqdns., Battle Flt., to U.S.S. New Mexico.

Lt. (jg) Grover B. H. Hall det. Aircf. Sqdns., Battle Flt., to U.S.S. Maryland.

Lt. (jg) Alvin I. Malstron det. Aircf. Sqdns., Battle Flt., to U.S.S. Pennsylvania.

Lt. (jg) Stanley J. Michael det. Aircf. Sqdns., Battle Flt., to U.S.S. Maryland.

Lt. (jg) Albert K. Morehouse det. Aircf. Sqdns., Battle Flt., to U.S.S. West Virginia.

Lt. (jg) Humphrey W. Toomey det. Aircf. Sqdns., Battle Fleet to U.S.S. Mississippi.

Ens. William A. Graham det. Nav. Air Sta., Pensacola, to U.S.S. Mississippi.

Ens. Wallace E. Guitar det. Nav. Air Sta., Pensacola, to U.S.S. Mississippi.

Lt. Harvey R. Dye det. U.S.S. Vestal, to Nav. Sup. Sta., N.O.B., Hampton Roads.

Ch. Gun. Charles E. Smitherman to duty Nav. Air Sta., Pensacola.

Lt. Karl S. Farnum det. U.S.S. Wyoming to Nav. Aircf. Fact., Navy Yard, Phila.

Marine Corps Orders

Sec. Lt. K. L. Moses det. N.A.S., Pensacola to M. B., Quantico.

Where to Fly

PUBLISHER'S NEWS LETTER

There have been so many new readers added to the subscription list of AVIATION since this odd page was started that it may be well to mention again its intent and purpose. For some years a difficulty was encountered in editing a small paper such as an aeronautical weekly which was receiving very little advertising patronage. There were many opinions that could be expressed in a paragraph or two that did not belong properly on an editorial page, and owing to the lack of space could not be given the prominence of an "article." There were also many matters that had to do with the publishing of a paper which it was thought would interest the ever growing group of readers. These friendly bits of comment are known in the editorial rooms of magazines as "blurbs." And perhaps the name fits some of the disconnected subjects that appear in these letters. It is possible that Cy Caldwell might invent a worse sounding word, but it is doubtful. The many letters which have been received asking that definite matters of aeronautical interest be discussed in the informal style of this page has led to its regular appearance, every week, instead of every once-in-a-while, as was the original intention.

* * *

One point may be made, while speaking of this letter, that may help to make for a better understanding among our readers. AVIATION has, since it started nearly ten years ago—during which time it has been the sole continuous source of reference information as to the news of the aeronautical happenings in the United States—regarded its policy as one that should reflect the soundest opinion of airmen. In attempting to do this many persons and organizations have been offended, but any paper that receives unanimous praise is lacking in the courage of its opinions.

* * *

As an instance, take our criticism of McCook Field and the political activities of the Dayton town boosters who have enjoyed having the government pay huge sums to make their city as they call it, the center of American Aviation. This criticism made our relations with the Air Service difficult, it caused McCook Field to start a competing paper, in some instances it prevented airplane manufacturers who were seeking the approval of McCook Field from advertising in AVIATION while they were at the same time yielding to the pressure of solicitation from the so called official organs of the service. Two of the largest companies discontinued their advertising entirely, fearing the consequences of supporting a paper which had the temerity to discuss the policies of those who passed on the products of advertisers. But this period passed, and McCook Field is now on a better footing because of the fact that some one dared to criticize. In fact, aside from the location in Dayton, which will always be unfortunate, geographically and politically, AVIATION is now prepared to praise wholeheartedly the fundamental policy of the Engineering Division and the manner in which efforts are being made to carry on the work there.

* * *

The poor bewildered N.A.A. has also had its share of criticism. Its first year was tragic because of the orgy of spending, without results; the second year was worse, as it was turned into a Dayton and National Cash Register publicity bureau; last year, it drew into its shell and did nothing worth while, except Contest Committee work, lost members, and became so much of a machine that the Navy was able to elect the controlling officers for the coming year. It has also started a magazine, which of course is useless, but is excused on the grounds that "we had to give our members something." This appears to be the usual outcropping of some organizations.

* * *

Publications might reverse the procedure by grouping readers into organizations, giving them little lapel decorations with wings, and using the organization for selfish purposes. But such a publication might also be accused of having to give its readers "something." Organizations should be what they purport to be—groups of persons interested in some cause—not publication businesses, except as they give members a record of the proceedings and meetings of the associations. They should lead by the soundness of their policy and the correctness of their ideas. If the readers of AVIATION were grouped into an association they would constitute one of the most influential groups of aeronautical advocates in the world. We say that because of a frequent analysis of our subscription list. If any more organizations start publications, a great temptation will be before us to give free memberships to all readers in an organization that would at least have ideas and stand for the progress of American aviation.

* * *

This letter has rambled along without any attempt to make it coherent. In fact that is one of the very things that it tries to avoid. It is just a letter put way back in the advertising pages which can be skipped or read as desired. It is pleasant to receive replies to letters. And it is even more so in the case of these "blurbs" that are not personally addressed. So let this one close with the old-fashioned ending of so many letters—"Write soon."—L.D.G.

INDEX TO ADVERTISERS

CLASSIFIED ADVERTISING

10 Cents a word, minimum charge $2.50 payable in advance. Address replies to box numbers, care AVIATION, 225 Fourth Ave., New York

FOR SALE Laird Swallow A-I condition, at sacrifice Address Box 393 AVIATION

WANTED K-6 and C-6 motors and parts; price must be low. Robertson Aircraft Corporation, St. Louis Flying Field, Anglum, Mo.

FOR SALE One brand new Curtiss Seagull with C6 or K6 motor, set up and ready to fly. Curtiss Metropolitan Airplane Co, Port Washington, Long Island

WANTED—Seagull or M F hulls. With or without surfaces. Also K-6 and C-6 Liberty 6 motors. State full particulars and condition in first letter. Harry Rogers, Curtiss Field, c/o A C McNamee, Garden City, L. I., N. Y.

Wanted one to five Avros, condition of motor not essential. Must be priced right What have you? Communicate Cloyd P Clevenger, Woodbine Hotel, St Louis, Mo

FOR SALE, or trade, practically brand new Curtiss C-6 Motor, with about $2000 00 worth of extra spare parts and an extra Curtiss C-6 Motor in perfect condition, flown less than 25 hours All now located at Denver, Colorado Would consider transporting and delivering it to any place in the U S I would also like to hear from an experienced commercial aviator on a proposition to bring this plane from Denver, Colorado, to Miami and handle it for us this winter, doing general commercial advertising Communicate by wire. Florida Loan and Brokerage Company, 217 N. E. First Street, Miami, Florida

FOR SALE: Thomas-Morse Scout with OX5, best looking conversion in the country. Sacrifice for quick sale. Price $875 00. Liberty engine, run two hours, $1000.00. HS2L Flying boat, with or without engine. Daniel Kiser, New Butler, Wisc

FOR SALE: Two Wacos 1924 and 1925 models. Both have been kept in hangar Good motors. E. G. Hamilton, 1265 Griswold Street, Detroit, Mich

USED BARGAIN complete Canuck, good flying condition $550.00 We will deliver anywhere at cost. SOUTHERN AIRWAYS, INC., 509 Navarro Street, San Antonio, Texas.

WANTED: Big Wing Oriole C6 or E Hisso, must be A-1 condition. State full particulars P.O. Box 308, Santa Fe, N.M.

Three-place highlift wing biplane Small, speedy, late model, with brand new OX5 motor and propeller, $1,000 Large photo 20c. Allison Airplane Co, Lawrence, Kansas.

Advertisements inserted regularly in AVIATION'S Classified Section pay for themselves many times over.

The Aircraft Service Directory

WHERE TO PROCURE EQUIPMENT AND SERVICES

AIRCRAFT SERVICE DIRECTORY
CONTINUED

WRIGHT-BELLANCA SIX SEATER

Powered With

WRIGHT WHIRLWIND 200 H.P. AIR COOLED ENGINE

138 M. P. H. With 1000 Lbs. Pay Load

Winners of

EFFICIENCY RACE, NEW YORK AIR RACES, 1925

Scoring 50% More Points Than Next Competitor

Wright-Bellanca Planes

With six heavy passengers this 200 H. P. plane makes 138 miles per hour. Its low resistance not only gives speed but also economy and durability. Slow down the engine until it develops only 115 H.P. (55% of its full power) and the plane still has 100 m.p.h. For safety, dependability and economy consider the advantages of a 100 mile per hour cruising speed with 6 passengers (1000 lbs. pay load) and using only 115 H.P. with a reserve of 85 H.P. (over 70% increase) instantly available. The fuel mileage averages 8 mi. per gal. at 100 m.p.h. with 6 passengers. The plane is ruggedly built, weighs 1790 lbs. empty and has high factors of safety throughout. It has good vision, low landing speed, quick take off and good climb. Winner of the Efficiency Race at the New York Air Races 1925 with a score of 602 points, more than 50% higher than the next competitor. For detailed information and complete specifications of the Wright-Bellanca Plane write for Bulletin No. 14.

Orders for Wright-Bellanca planes are being taken now for deliveries early in the spring. The price complete with Whirlwind engine is $12,000 f.o.b. Paterson.

Wright Whirlwind Engines

To hundreds of pilots the Wright Whirlwind engine needs no racing introduction. They have flown it for years and have seen for themselves the development built into each succeeding model beginning with the Lawrance J-1 and going on to the fifth model the present J-4-A. And the design is not all; during these years our shop has been training and selecting men, improving tools and methods. Hundreds of pilots know the Wright Whirlwinds. Cuban pilots fly it in land planes from Cuba to the Isle of Pines crossing 40 miles of ocean. Canadian pilots fly it to the Hudson Bay country. Peruvian pilots fly it at the Equator. Huff-Daland Dusting pilots flew 14 of them all this season and did not unbox their two spare engines; the Whirlwinds in the Fokker 3 engine 10 passenger airliner finished the Ford Tour with a perfect score and the Navy pilots have flown them all over the world. For detailed specifications of Wright Whirlwind Engines write for Bulletin No. 8.

WRIGHT AERONAUTICAL CORPORATION

Paterson, N. J. U. S. A.

WRIGHT ENGINES